

### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10381429001	W26-GW-030917	Water	03/09/17 09:00	03/10/17 10:30
10381429002	Trip Blank	Water	03/09/17 00:00	03/10/17 10:30

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10381429

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10381429001	W26-GW-030917	EPA 8260B	DJB	83	PASI-M
10381429002	Trip Blank	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10381429001</b>	<b>W26-GW-030917</b>					
EPA 8260B	Carbon tetrachloride	28.0	ug/L	0.50	03/14/17 17:31	
EPA 8260B	Chloroform	2.2	ug/L	1.0	03/14/17 17:31	
<b>10381429002</b>	<b>Trip Blank</b>					
EPA 8260B	Methylene Chloride	0.50J	ug/L	4.0	03/14/17 14:08	

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** March 15, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 463838

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10381411008,10381429001

R1: RPD value was outside control limits.

- MSD (Lab ID: 2535881)
  - Acrolein
  - Diisopropyl ether

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

Sample: **W26-GW-030917** Lab ID: **10381429001** Collected: 03/09/17 09:00 Received: 03/10/17 10:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		03/14/17 17:31	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		03/14/17 17:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		03/14/17 17:31	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		03/14/17 17:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		03/14/17 17:31	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		03/14/17 17:31	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		03/14/17 17:31	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		03/14/17 17:31	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	4.0	0.17	1		03/14/17 17:31	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		03/14/17 17:31	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	4.0	0.14	1		03/14/17 17:31	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		03/14/17 17:31	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		03/14/17 17:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		03/14/17 17:31	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		03/14/17 17:31	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		03/14/17 17:31	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		03/14/17 17:31	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		03/14/17 17:31	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	1.0	0.042	1		03/14/17 17:31	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		03/14/17 17:31	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		03/14/17 17:31	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		03/14/17 17:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		03/14/17 17:31	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		03/14/17 17:31	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		03/14/17 17:31	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		03/14/17 17:31	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		03/14/17 17:31	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		03/14/17 17:31	591-78-6	
4-Chlorotoluene	<0.048	ug/L	1.0	0.048	1		03/14/17 17:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		03/14/17 17:31	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		03/14/17 17:31	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		03/14/17 17:31	107-02-8	R1
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		03/14/17 17:31	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		03/14/17 17:31	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		03/14/17 17:31	108-86-1	
Bromochloromethane	<0.082	ug/L	4.0	0.082	1		03/14/17 17:31	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		03/14/17 17:31	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		03/14/17 17:31	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		03/14/17 17:31	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		03/14/17 17:31	75-15-0	
Carbon tetrachloride	28.0	ug/L	0.50	0.079	1		03/14/17 17:31	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		03/14/17 17:31	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		03/14/17 17:31	75-00-3	
Chloroform	2.2	ug/L	1.0	0.21	1		03/14/17 17:31	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		03/14/17 17:31	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		03/14/17 17:31	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

**Sample: W26-GW-030917**      **Lab ID: 10381429001**      Collected: 03/09/17 09:00      Received: 03/10/17 10:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		03/14/17 17:31	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		03/14/17 17:31	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		03/14/17 17:31	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		03/14/17 17:31	108-20-3	R1
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		03/14/17 17:31	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		03/14/17 17:31	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		03/14/17 17:31	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	1.0	0.064	1		03/14/17 17:31	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		03/14/17 17:31	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		03/14/17 17:31	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		03/14/17 17:31	91-20-3	
Styrene	<0.056	ug/L	1.0	0.056	1		03/14/17 17:31	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		03/14/17 17:31	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		03/14/17 17:31	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		03/14/17 17:31	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		03/14/17 17:31	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		03/14/17 17:31	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		03/14/17 17:31	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		03/14/17 17:31	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		03/14/17 17:31	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		03/14/17 17:31	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		03/14/17 17:31	10061-01-5	
m&p-Xylene	<0.11	ug/L	2.0	0.11	1		03/14/17 17:31	179601-23-1	
n-Butylbenzene	<0.16	ug/L	4.0	0.16	1		03/14/17 17:31	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		03/14/17 17:31	103-65-1	
o-Xylene	<0.044	ug/L	1.0	0.044	1		03/14/17 17:31	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	1.0	0.064	1		03/14/17 17:31	99-87-6	
sec-Butylbenzene	<0.094	ug/L	1.0	0.094	1		03/14/17 17:31	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		03/14/17 17:31	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		03/14/17 17:31	75-65-0	
tert-Butylbenzene	<0.051	ug/L	1.0	0.051	1		03/14/17 17:31	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		03/14/17 17:31	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		03/14/17 17:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		03/14/17 17:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	112	%	75-125		1		03/14/17 17:31	17060-07-0	
Toluene-d8 (S)	114	%	75-125		1		03/14/17 17:31	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		03/14/17 17:31	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

**Sample: Trip Blank**      **Lab ID: 10381429002**      Collected: 03/09/17 00:00      Received: 03/10/17 10:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		03/14/17 14:08	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		03/14/17 14:08	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		03/14/17 14:08	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		03/14/17 14:08	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		03/14/17 14:08	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		03/14/17 14:08	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		03/14/17 14:08	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		03/14/17 14:08	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	4.0	0.17	1		03/14/17 14:08	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		03/14/17 14:08	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	4.0	0.14	1		03/14/17 14:08	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		03/14/17 14:08	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		03/14/17 14:08	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		03/14/17 14:08	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		03/14/17 14:08	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		03/14/17 14:08	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		03/14/17 14:08	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		03/14/17 14:08	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	1.0	0.042	1		03/14/17 14:08	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		03/14/17 14:08	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		03/14/17 14:08	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		03/14/17 14:08	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		03/14/17 14:08	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		03/14/17 14:08	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		03/14/17 14:08	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		03/14/17 14:08	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		03/14/17 14:08	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		03/14/17 14:08	591-78-6	
4-Chlorotoluene	<0.048	ug/L	1.0	0.048	1		03/14/17 14:08	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		03/14/17 14:08	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		03/14/17 14:08	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		03/14/17 14:08	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		03/14/17 14:08	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		03/14/17 14:08	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		03/14/17 14:08	108-86-1	
Bromochloromethane	<0.082	ug/L	4.0	0.082	1		03/14/17 14:08	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		03/14/17 14:08	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		03/14/17 14:08	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		03/14/17 14:08	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		03/14/17 14:08	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		03/14/17 14:08	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		03/14/17 14:08	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		03/14/17 14:08	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		03/14/17 14:08	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		03/14/17 14:08	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		03/14/17 14:08	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

**Sample: Trip Blank**      **Lab ID: 10381429002**      Collected: 03/09/17 00:00      Received: 03/10/17 10:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		03/14/17 14:08	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		03/14/17 14:08	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		03/14/17 14:08	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		03/14/17 14:08	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		03/14/17 14:08	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		03/14/17 14:08	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		03/14/17 14:08	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	1.0	0.064	1		03/14/17 14:08	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		03/14/17 14:08	1634-04-4	
Methylene Chloride	0.50J	ug/L	4.0	0.097	1		03/14/17 14:08	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		03/14/17 14:08	91-20-3	
Styrene	<0.056	ug/L	1.0	0.056	1		03/14/17 14:08	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		03/14/17 14:08	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		03/14/17 14:08	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		03/14/17 14:08	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		03/14/17 14:08	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		03/14/17 14:08	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		03/14/17 14:08	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		03/14/17 14:08	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		03/14/17 14:08	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		03/14/17 14:08	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		03/14/17 14:08	10061-01-5	
m&p-Xylene	<0.11	ug/L	2.0	0.11	1		03/14/17 14:08	179601-23-1	
n-Butylbenzene	<0.16	ug/L	4.0	0.16	1		03/14/17 14:08	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		03/14/17 14:08	103-65-1	
o-Xylene	<0.044	ug/L	1.0	0.044	1		03/14/17 14:08	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	1.0	0.064	1		03/14/17 14:08	99-87-6	
sec-Butylbenzene	<0.094	ug/L	1.0	0.094	1		03/14/17 14:08	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		03/14/17 14:08	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		03/14/17 14:08	75-65-0	
tert-Butylbenzene	<0.051	ug/L	1.0	0.051	1		03/14/17 14:08	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		03/14/17 14:08	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		03/14/17 14:08	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		03/14/17 14:08	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	113	%	75-125		1		03/14/17 14:08	17060-07-0	
Toluene-d8 (S)	113	%	75-125		1		03/14/17 14:08	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		03/14/17 14:08	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

QC Batch: 463838 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10381429001, 10381429002

METHOD BLANK: 2535876 Matrix: Water

Associated Lab Samples: 10381429001, 10381429002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	03/14/17 13:01	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	03/14/17 13:01	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	03/14/17 13:01	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	03/14/17 13:01	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	03/14/17 13:01	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	03/14/17 13:01	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	03/14/17 13:01	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	03/14/17 13:01	
1,2,3-Trichlorobenzene	ug/L	<0.17	4.0	0.17	03/14/17 13:01	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	03/14/17 13:01	
1,2,4-Trichlorobenzene	ug/L	<0.14	4.0	0.14	03/14/17 13:01	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	1.0	0.068	03/14/17 13:01	MN
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	03/14/17 13:01	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	03/14/17 13:01	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	03/14/17 13:01	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	03/14/17 13:01	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	03/14/17 13:01	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	03/14/17 13:01	
1,3,5-Trimethylbenzene	ug/L	<0.042	1.0	0.042	03/14/17 13:01	MN
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	03/14/17 13:01	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	03/14/17 13:01	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	03/14/17 13:01	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	03/14/17 13:01	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	03/14/17 13:01	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	03/14/17 13:01	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	03/14/17 13:01	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	03/14/17 13:01	
2-Hexanone	ug/L	<0.19	5.0	0.19	03/14/17 13:01	
4-Chlorotoluene	ug/L	<0.048	1.0	0.048	03/14/17 13:01	MN
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	03/14/17 13:01	
Acetone	ug/L	<0.64	20.0	0.64	03/14/17 13:01	
Acrolein	ug/L	<2.1	10.0	2.1	03/14/17 13:01	
Acrylonitrile	ug/L	<0.49	10.0	0.49	03/14/17 13:01	
Benzene	ug/L	<0.042	0.50	0.042	03/14/17 13:01	
Bromobenzene	ug/L	<0.087	0.50	0.087	03/14/17 13:01	
Bromochloromethane	ug/L	<0.082	4.0	0.082	03/14/17 13:01	MN
Bromodichloromethane	ug/L	<0.068	0.50	0.068	03/14/17 13:01	
Bromoform	ug/L	<0.11	4.0	0.11	03/14/17 13:01	
Bromomethane	ug/L	<0.20	4.0	0.20	03/14/17 13:01	
Carbon disulfide	ug/L	<0.20	1.0	0.20	03/14/17 13:01	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	03/14/17 13:01	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

METHOD BLANK: 2535876

Matrix: Water

Associated Lab Samples: 10381429001, 10381429002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	03/14/17 13:01	
Chloroethane	ug/L	<0.12	1.0	0.12	03/14/17 13:01	
Chloroform	ug/L	<0.21	1.0	0.21	03/14/17 13:01	
Chloromethane	ug/L	<0.080	4.0	0.080	03/14/17 13:01	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	03/14/17 13:01	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	03/14/17 13:01	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	03/14/17 13:01	
Dibromomethane	ug/L	<0.14	1.0	0.14	03/14/17 13:01	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	03/14/17 13:01	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	03/14/17 13:01	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	03/14/17 13:01	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	03/14/17 13:01	
Ethylbenzene	ug/L	<0.075	0.50	0.075	03/14/17 13:01	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	03/14/17 13:01	
Isopropylbenzene (Cumene)	ug/L	<0.064	1.0	0.064	03/14/17 13:01	MN
m&p-Xylene	ug/L	<0.11	2.0	0.11	03/14/17 13:01	MN
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	03/14/17 13:01	
Methylene Chloride	ug/L	<0.097	4.0	0.097	03/14/17 13:01	
n-Butylbenzene	ug/L	<0.16	4.0	0.16	03/14/17 13:01	MN
n-Propylbenzene	ug/L	<0.049	0.50	0.049	03/14/17 13:01	
Naphthalene	ug/L	<0.064	4.0	0.064	03/14/17 13:01	MN
o-Xylene	ug/L	<0.044	1.0	0.044	03/14/17 13:01	MN
p-Isopropyltoluene	ug/L	<0.064	1.0	0.064	03/14/17 13:01	MN
sec-Butylbenzene	ug/L	<0.094	1.0	0.094	03/14/17 13:01	MN
Styrene	ug/L	<0.056	1.0	0.056	03/14/17 13:01	MN
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	03/14/17 13:01	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	03/14/17 13:01	
tert-Butylbenzene	ug/L	<0.051	1.0	0.051	03/14/17 13:01	MN
Tetrachloroethene	ug/L	<0.13	0.50	0.13	03/14/17 13:01	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	03/14/17 13:01	
Toluene	ug/L	<0.059	0.50	0.059	03/14/17 13:01	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	03/14/17 13:01	
trans-1,3-Dichloropropene	ug/L	<0.044	1.0	0.044	03/14/17 13:01	MN
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	03/14/17 13:01	
Trichloroethene	ug/L	<0.044	0.40	0.044	03/14/17 13:01	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	03/14/17 13:01	
Vinyl acetate	ug/L	<0.12	10.0	0.12	03/14/17 13:01	
Vinyl chloride	ug/L	<0.098	0.20	0.098	03/14/17 13:01	
Xylene (Total)	ug/L	<0.15	1.5	0.15	03/14/17 13:01	
1,2-Dichloroethane-d4 (S)	%	109	75-125		03/14/17 13:01	
4-Bromofluorobenzene (S)	%	100	75-125		03/14/17 13:01	
Toluene-d8 (S)	%	114	75-125		03/14/17 13:01	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

LABORATORY CONTROL SAMPLE & LCSD: 2535877		2536860									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	21.6	21.7	108	109	75-125	1	30		
1,1,1-Trichloroethane	ug/L	20	20.1	19.4	101	97	74-125	3	30		
1,1,2,2-Tetrachloroethane	ug/L	20	21.3	21.6	106	108	67-131	1	30		
1,1,2-Trichloroethane	ug/L	20	21.5	21.7	107	109	75-125	1	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.9	17.4	90	87	75-125	3	30		
1,1-Dichloroethane	ug/L	20	20.5	19.5	103	98	74-125	5	30		
1,1-Dichloroethene	ug/L	20	19.3	18.7	97	94	74-125	3	30		
1,1-Dichloropropene	ug/L	20	19.6	19.3	98	97	74-125	1	30		
1,2,3-Trichlorobenzene	ug/L	20	19.4	20.4	97	102	63-131	5	30		
1,2,3-Trichloropropane	ug/L	20	21.5	21.0	108	105	73-125	2	30		
1,2,4-Trichlorobenzene	ug/L	20	18.4	19.7	92	99	66-126	7	30		
1,2,4-Trimethylbenzene	ug/L	20	19.7	20.3	99	101	74-129	3	30		
1,2-Dibromo-3-chloropropane	ug/L	50	47.2	49.0	94	98	54-129	4	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.8	21.1	104	105	75-125	1	30		
1,2-Dichlorobenzene	ug/L	20	22.1	22.7	111	113	75-125	2	30		
1,2-Dichloroethane	ug/L	20	17.8	17.6	89	88	75-125	1	30		
1,2-Dichloroethene (Total)	ug/L	40	38.3	34.9	96	87	75-125	9	30		
1,2-Dichloropropane	ug/L	20	20.1	19.1	100	96	75-125	5	30		
1,3,5-Trimethylbenzene	ug/L	20	19.7	20.3	99	101	73-127	3	30		
1,3-Dichlorobenzene	ug/L	20	22.0	22.5	110	112	75-125	2	30		
1,3-Dichloropropane	ug/L	20	20.5	21.1	102	106	69-125	3	30		
1,4-Dichlorobenzene	ug/L	20	21.7	22.0	109	110	75-125	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	343	437	86	109	70-130	24	30		
2,2,4-Trimethylpentane	ug/L	20	19.9	19.1	100	95	67-138	4	30		
2,2-Dichloropropane	ug/L	20	20.8	17.7	104	88	69-125	16	30		
2-Butanone (MEK)	ug/L	100	91.5	85.8	92	86	48-145	6	30		
2-Chlorotoluene	ug/L	20	22.2	22.7	111	113	74-125	2	30		
2-Hexanone	ug/L	100	95.9	93.6	96	94	63-135	2	30		
4-Chlorotoluene	ug/L	20	20.3	20.9	101	105	73-125	3	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.9	97.0	98	97	53-138	1	30		
Acetone	ug/L	100	83.5	94.8	83	95	70-142	13	30		
Acrolein	ug/L	200	178	177	89	88	44-150	1	30		
Acrylonitrile	ug/L	200	204	190	102	95	68-125	7	30		
Benzene	ug/L	20	19.3	18.6	96	93	65-125	3	30		
Bromobenzene	ug/L	20	21.8	22.4	109	112	75-125	3	30		
Bromochloromethane	ug/L	20	19.0	16.8	95	84	75-125	12	30		
Bromodichloromethane	ug/L	20	20.2	18.9	101	95	73-125	6	30		
Bromoform	ug/L	20	21.6	20.2	108	101	69-125	7	30		
Bromomethane	ug/L	20	14.4	16.4	72	82	40-136	13	30		
Carbon disulfide	ug/L	20	17.3	16.6	87	83	36-150	4	30		
Carbon tetrachloride	ug/L	20	19.9	19.4	99	97	70-125	3	30		
Chlorobenzene	ug/L	20	20.7	20.8	103	104	75-125	1	30		
Chloroethane	ug/L	20	19.0	16.4	95	82	67-141	15	30		
Chloroform	ug/L	20	19.6	18.8	98	94	75-125	4	30		
Chloromethane	ug/L	20	18.1	16.9	91	85	50-150	7	30		
cis-1,2-Dichloroethene	ug/L	20	19.1	16.4	96	82	75-125	15	30		
cis-1,3-Dichloropropene	ug/L	20	20.9	19.8	105	99	75-125	6	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10381429

LABORATORY CONTROL SAMPLE & LCSD:		2535877		2536860							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	21.0	21.8	105	109	75-125	4	30		
Dibromomethane	ug/L	20	20.4	19.4	102	97	75-129	5	30		
Dichlorodifluoromethane	ug/L	20	18.0	17.2	90	86	59-135	5	30		
Dichlorofluoromethane	ug/L	20	18.6	16.6	93	83	74-130	12	30		
Diisopropyl ether	ug/L	20	19.6	19.4	98	97	71-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	18.9	18.9	94	94	70-130	0	30		
Ethylbenzene	ug/L	20	21.2	21.2	106	106	75-125	0	30		
Hexachloro-1,3-butadiene	ug/L	20	22.0	22.1	110	110	72-126	0	30		
Isopropylbenzene (Cumene)	ug/L	20	19.0	18.5	95	92	71-136	3	30		
m&p-Xylene	ug/L	40	39.1	39.4	98	99	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	19.9	19.8	100	99	73-127	1	30		
Methylene Chloride	ug/L	20	19.2	18.2	96	91	68-128	6	30		
n-Butylbenzene	ug/L	20	18.8	18.9	94	94	70-126	0	30		
n-Propylbenzene	ug/L	20	21.9	22.3	110	112	67-131	2	30		
Naphthalene	ug/L	20	16.1	17.3	81	87	52-134	7	30		
o-Xylene	ug/L	20	18.9	18.2	94	91	75-125	3	30		
p-Isopropyltoluene	ug/L	20	20.1	20.5	101	102	74-125	2	30		
sec-Butylbenzene	ug/L	20	19.8	20.1	99	101	69-134	2	30		
Styrene	ug/L	20	20.1	19.2	100	96	75-125	5	30		
tert-Amylmethyl ether	ug/L	20	18.6	19.0	93	95	70-130	2	30		
tert-Butyl Alcohol	ug/L	200	222	235	111	117	66-128	6	30		
tert-Butylbenzene	ug/L	20	18.6	19.5	93	98	71-128	5	30		
Tetrachloroethene	ug/L	20	20.7	21.8	104	109	74-125	5	30		
Tetrahydrofuran	ug/L	200	165	193	83	97	64-142	16	30		
Toluene	ug/L	20	19.4	20.6	97	103	75-125	6	30		
trans-1,2-Dichloroethene	ug/L	20	19.2	18.5	96	92	73-125	4	30		
trans-1,3-Dichloropropene	ug/L	20	19.9	20.3	99	102	75-125	2	30		
trans-1,4-Dichloro-2-butene	ug/L	50	51.7	49.7	103	99	54-133	4	30		
Trichloroethene	ug/L	20	19.9	20.0	100	100	75-125	0	30		
Trichlorofluoromethane	ug/L	20	19.0	17.1	95	85	75-126	11	30		
Vinyl acetate	ug/L	20	18.7	18.4	93	92	67-126	2	30		
Vinyl chloride	ug/L	20	19.0	17.7	95	89	72-125	7	30		
Xylene (Total)	ug/L	60	58.0	57.6	97	96	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				107	103	75-125				
4-Bromofluorobenzene (S)	%				95	101	75-125				
Toluene-d8 (S)	%				103	110	75-125				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2535878		2535879								
Parameter	Units	10381411008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	20	20	20.2	21.3	101	107	75-127	5	30	
1,1,1-Trichloroethane	ug/L	0.50 U	20	20	20.2	21.3	101	107	66-142	5	30	
1,1,2,2-Tetrachloroethane	ug/L	0.50 U	20	20	20.0	20.9	100	105	70-131	5	30	
1,1,2-Trichloroethane	ug/L	0.50 U	20	20	20.0	21.0	100	105	75-128	5	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10381429

Parameter	Units	2535878		2535879		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
1,1,2-Trichlorotrifluoroethane	ug/L	2.5	20	20	23.2	25.0	103	112	54-150	8	30		
1,1-Dichloroethane	ug/L	1.7	20	20	20.7	21.9	95	101	58-147	6	30		
1,1-Dichloroethene	ug/L	0.52	20	20	19.9	21.4	97	104	49-150	7	30		
1,1-Dichloropropene	ug/L	0.50 U	20	20	20.0	21.6	100	108	58-147	8	30		
1,2,3-Trichlorobenzene	ug/L	4.0 U	20	20	19.6	21.3	98	107	57-139	9	30		
1,2,3-Trichloropropane	ug/L	4.0 U	20	20	19.9	20.6	99	103	71-127	4	30		
1,2,4-Trichlorobenzene	ug/L	4.0 U	20	20	19.1	20.5	95	102	55-136	7	30		
1,2,4-Trimethylbenzene	ug/L	1.0 U	20	20	19.2	20.6	96	103	67-138	7	30		
1,2-Dibromo-3-chloropropane	ug/L	4.0 U	50	50	45.3	47.3	91	95	63-136	4	30		
1,2-Dibromoethane (EDB)	ug/L	0.50 U	20	20	19.0	20.4	95	102	74-125	7	30		
1,2-Dichlorobenzene	ug/L	2.3	20	20	23.7	25.2	107	115	75-125	6	30		
1,2-Dichloroethane	ug/L	0.50 U	20	20	16.9	18.3	84	91	63-133	8	30		
1,2-Dichloroethene (Total)	ug/L	3.6	40	40	42.7	44.8	98	103	55-146	5	30		
1,2-Dichloropropane	ug/L	4.0 U	20	20	18.8	20.0	94	100	63-138	6	30		
1,3,5-Trimethylbenzene	ug/L	1.0 U	20	20	19.4	20.9	97	105	69-136	7	30		
1,3-Dichlorobenzene	ug/L	0.50 U	20	20	21.6	22.9	108	115	75-125	6	30		
1,3-Dichloropropane	ug/L	0.50 U	20	20	19.6	21.3	98	106	65-135	8	30		
1,4-Dichlorobenzene	ug/L	1.4	20	20	22.0	23.6	103	111	70-126	7	30		
1,4-Dioxane (p-Dioxane)	ug/L	200 U	400	400	378	415	95	104	54-145	9	30		
2,2,4-Trimethylpentane	ug/L	4.0 U	20	20	24.6	26.1	123	131	30-150	6	30		
2,2-Dichloropropane	ug/L	1.0 U	20	20	20.6	22.1	103	111	39-148	7	30		
2-Butanone (MEK)	ug/L	5.0 U	100	100	81.3	84.0	81	84	50-144	3	30		
2-Chlorotoluene	ug/L	0.50 U	20	20	21.6	23.2	108	116	71-135	7	30		
2-Hexanone	ug/L	5.0 U	100	100	85.4	89.9	85	90	43-150	5	30		
4-Chlorotoluene	ug/L	1.0 U	20	20	19.9	21.1	99	106	71-131	6	30		
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	100	100	89.2	93.5	89	94	60-147	5	30		
Acetone	ug/L	20.0 U	100	100	82.9	90.1	83	90	59-150	8	30		
Acrolein	ug/L	10.0 U	200	200	224	231	112	116	30-150	3	30		
Acrylonitrile	ug/L	10.0 U	200	200	179	184	90	92	41-148	3	30		
Benzene	ug/L	0.86	20	20	19.5	21.0	93	101	61-138	7	30		
Bromobenzene	ug/L	0.50 U	20	20	21.0	22.6	105	113	74-130	7	30		
Bromochloromethane	ug/L	4.0 U	20	20	17.9	19.7	89	98	65-137	10	30		
Bromodichloromethane	ug/L	0.50 U	20	20	17.5	18.9	87	94	66-136	8	30		
Bromoform	ug/L	4.0 U	20	20	18.0	19.1	90	96	71-125	6	30		
Bromomethane	ug/L	4.0 U	20	20	18.6	19.5	93	98	30-150	5	30		
Carbon disulfide	ug/L	1.0 U	20	20	17.2	18.3	86	92	30-150	6	30		
Carbon tetrachloride	ug/L	0.50 U	20	20	20.4	21.2	102	106	68-140	4	30		
Chlorobenzene	ug/L	0.50 U	20	20	20.0	21.4	99	107	75-132	7	30		
Chloroethane	ug/L	1.0 U	20	20	19.6	19.7	98	98	55-150	1	30		
Chloroform	ug/L	1.0 U	20	20	18.5	20.0	93	100	64-139	7	30		
Chloromethane	ug/L	4.0 U	20	20	19.2	18.4	96	92	73-150	4	30		
cis-1,2-Dichloroethene	ug/L	3.6	20	20	23.5	24.5	99	105	62-138	4	30		
cis-1,3-Dichloropropene	ug/L	0.50 U	20	20	16.7	18.1	84	90	70-125	8	30		
Dibromochloromethane	ug/L	0.50 U	20	20	19.6	21.0	98	105	74-125	7	30		

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2535878		2535879									
Parameter	Units	10381411008	MS	MSD	MS	MSD	MS	MSD	% Rec	Max			Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD		
Dibromomethane	ug/L	1.0 U	20	20	18.0	18.8	90	94	66-138	4	30		
Dichlorodifluoromethane	ug/L	42.6	20	20	63.2	61.8	103	96	53-150	2	30		
Dichlorofluoromethane	ug/L	6.7	20	20	25.6	25.5	95	94	58-150	0	30		
Diisopropyl ether	ug/L	1.0 U	20	20	18.0	19.4	90	97	50-139	8	30		
Ethyl-tert-butyl ether	ug/L	0.50 U	20	20	18.3	18.7	91	94	30-140	2	30		
Ethylbenzene	ug/L	0.50 U	20	20	20.2	21.8	101	109	66-141	8	30		
Hexachloro-1,3-butadiene	ug/L	1.0 U	20	20	27.2	26.9	136	135	63-139	1	30		
Isopropylbenzene (Cumene)	ug/L	1.0 U	20	20	17.5	19.1	88	95	65-146	9	30		
m&p-Xylene	ug/L	2.0 U	40	40	37.4	40.6	93	102	72-142	8	30		
Methyl-tert-butyl ether	ug/L	0.50 U	20	20	18.6	19.0	93	95	63-134	3	30		
Methylene Chloride	ug/L	4.0 U	20	20	17.7	18.5	88	93	49-143	5	30		
n-Butylbenzene	ug/L	4.0 U	20	20	19.9	21.2	99	106	67-134	6	30		
n-Propylbenzene	ug/L	0.50 U	20	20	21.7	23.2	109	116	62-142	6	30		
Naphthalene	ug/L	4.0 U	20	20	15.7	17.0	79	85	41-150	8	30		
o-Xylene	ug/L	1.0 U	20	20	17.2	18.9	86	94	66-138	9	30		
p-Isopropyltoluene	ug/L	1.0 U	20	20	20.2	21.7	101	109	64-137	7	30		
sec-Butylbenzene	ug/L	1.0 U	20	20	20.7	21.6	103	108	65-142	4	30		
Styrene	ug/L	1.0 U	20	20	17.9	19.5	90	97	61-142	8	30		
tert-Amylmethyl ether	ug/L	0.50 U	20	20	17.9	19.3	89	96	65-125	8	30		
tert-Butyl Alcohol	ug/L	10.0 U	200	200	202	217	101	108	59-138	7	30		
tert-Butylbenzene	ug/L	1.0 U	20	20	19.5	20.8	98	104	69-135	6	30		
Tetrachloroethene	ug/L	15.7	20	20	35.9	37.5	101	109	62-142	4	30		
Tetrahydrofuran	ug/L	10.0 U	200	200	172	190	86	95	55-150	10	30		
Toluene	ug/L	0.50 U	20	20	19.8	21.2	99	106	66-132	7	30		
trans-1,2-Dichloroethene	ug/L	0.50 U	20	20	19.2	20.3	96	101	48-150	5	30		
trans-1,3-Dichloropropene	ug/L	1.0 U	20	20	19.0	20.2	95	101	65-130	6	30		
trans-1,4-Dichloro-2-butene	ug/L	10.0 U	50	50	48.3	50.1	97	100	31-150	4	30		
Trichloroethene	ug/L	4.8	20	20	24.5	25.7	99	105	64-142	5	30		
Trichlorofluoromethane	ug/L	1.8	20	20	23.7	23.6	109	109	63-150	0	30		
Vinyl acetate	ug/L	10.0 U	20	20	17.9	18.0	89	90	30-150	1	30		
Vinyl chloride	ug/L	0.20 U	20	20	22.2	21.3	111	106	58-150	4	30		
Xylene (Total)	ug/L	1.5 U	60	60	54.6	59.5	91	99	70-140	9	30		
1,2-Dichloroethane-d4 (S)	%						106	105	75-125				
4-Bromofluorobenzene (S)	%						101	101	75-125				
Toluene-d8 (S)	%						106	107	75-125				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2535880		2535881									
Parameter	Units	10381429001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max			Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD		
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	20.5	21.8	103	109	75-127	6	30		
1,1,1-Trichloroethane	ug/L	<0.057	20	20	20.2	21.8	101	109	66-142	8	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	20.2	20.6	101	103	70-131	2	30		
1,1,2-Trichloroethane	ug/L	<0.064	20	20	20.6	20.7	103	104	75-128	1	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10381429

Parameter	Units	10381429001		2535880		2535881		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	21.0	27.1	105	136	54-150	25	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	19.8	25.6	99	128	58-147	26	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	19.7	24.8	98	124	49-150	23	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	20.8	21.4	104	107	58-147	3	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	20.2	20.9	101	104	57-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.6	20.8	98	104	71-127	6	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	19.9	20.2	100	101	55-136	1	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	20.4	20.9	102	104	67-138	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	46.5	49.3	93	99	63-136	6	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	19.7	20.9	99	105	74-125	6	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	22.2	22.3	111	112	75-125	1	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	17.2	18.9	86	94	63-133	9	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	39.1	45.5	98	114	55-146	15	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	19.1	19.8	95	99	63-138	3	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	20.5	21.0	102	105	69-136	3	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	21.5	22.6	107	113	75-125	5	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	20.5	20.6	102	103	65-135	1	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	21.4	22.2	107	111	70-126	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	378	395	94	99	54-145	4	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	24.7	25.0	123	125	30-150	1	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	21.1	22.5	106	113	39-148	7	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	80.7	87.5	81	87	50-144	8	30		
2-Chlorotoluene	ug/L	<0.084	20	20	22.4	23.1	112	116	71-135	3	30		
2-Hexanone	ug/L	<0.19	100	100	88.7	96.4	89	96	43-150	8	30		
4-Chlorotoluene	ug/L	<0.048	20	20	20.8	21.1	104	105	71-131	1	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	91.4	97.3	91	97	60-147	6	30		
Acetone	ug/L	<0.64	100	100	86.7	91.9	87	92	59-150	6	30		
Acrolein	ug/L	<2.1	200	200	214	294	107	147	30-150	32	30	R1	
Acrylonitrile	ug/L	<0.49	200	200	179	234	90	117	41-148	26	30		
Benzene	ug/L	<0.042	20	20	19.3	19.6	96	98	61-138	2	30		
Bromobenzene	ug/L	<0.087	20	20	21.7	22.3	108	111	74-130	3	30		
Bromochloromethane	ug/L	<0.082	20	20	18.0	19.3	90	96	65-137	7	30		
Bromodichloromethane	ug/L	<0.068	20	20	18.0	19.4	90	97	66-136	8	30		
Bromoform	ug/L	<0.11	20	20	19.1	20.3	96	101	71-125	6	30		
Bromomethane	ug/L	<0.20	20	20	19.9	24.8	100	124	30-150	22	30		
Carbon disulfide	ug/L	<0.20	20	20	17.0	22.0	84	109	30-150	25	30		
Carbon tetrachloride	ug/L	28.0	20	20	43.1	45.1	75	86	68-140	5	30		
Chlorobenzene	ug/L	<0.066	20	20	20.6	21.3	103	106	75-132	3	30		
Chloroethane	ug/L	<0.12	20	20	19.1	24.4	95	122	55-150	24	30		
Chloroform	ug/L	2.2	20	20	20.5	21.7	91	97	64-139	6	30		
Chloromethane	ug/L	<0.080	20	20	18.1	23.0	90	115	73-150	24	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	19.6	20.7	98	103	62-138	5	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	17.5	18.7	88	93	70-125	6	30		
Dibromochloromethane	ug/L	<0.048	20	20	20.7	21.4	104	107	74-125	3	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10381429

Parameter	Units	2535880		2535881		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10381429001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<0.14	20	20	18.1	19.3	90	96	66-138	6	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	21.3	27.7	107	138	53-150	26	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	19.2	24.5	96	122	58-150	24	30		
Diisopropyl ether	ug/L	<0.050	20	20	17.8	25.5	89	128	50-139	35	30	R1	
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	18.6	23.9	93	120	30-140	25	30		
Ethylbenzene	ug/L	<0.075	20	20	21.4	22.4	107	112	66-141	5	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	25.1	24.5	126	123	63-139	3	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	19.2	20.0	96	100	65-146	4	30		
m&p-Xylene	ug/L	<0.11	40	40	40.4	41.1	101	103	72-142	2	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.1	24.9	95	125	63-134	26	30		
Methylene Chloride	ug/L	<0.097	20	20	17.3	23.1	87	115	49-143	28	30		
n-Butylbenzene	ug/L	<0.16	20	20	20.5	21.1	103	106	67-134	3	30		
n-Propylbenzene	ug/L	<0.049	20	20	23.1	23.7	115	119	62-142	3	30		
Naphthalene	ug/L	<0.064	20	20	17.1	17.7	86	89	41-150	4	30		
o-Xylene	ug/L	<0.044	20	20	19.1	19.5	95	98	66-138	2	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	21.2	21.8	106	109	64-137	3	30		
sec-Butylbenzene	ug/L	<0.094	20	20	21.2	21.8	106	109	65-142	3	30		
Styrene	ug/L	<0.056	20	20	19.1	19.6	95	98	61-142	3	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	18.5	19.5	92	97	65-125	5	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	208	248	104	124	59-138	17	30		
tert-Butylbenzene	ug/L	<0.051	20	20	20.6	21.0	103	105	69-135	2	30		
Tetrachloroethene	ug/L	<0.13	20	20	22.6	22.6	113	113	62-142	0	30		
Tetrahydrofuran	ug/L	<1.5	200	200	187	156	94	78	55-150	18	30		
Toluene	ug/L	<0.059	20	20	20.7	20.6	104	103	66-132	0	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	19.5	24.9	98	124	48-150	24	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	19.4	20.6	97	103	65-130	6	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	49.2	52.6	98	105	31-150	7	30		
Trichloroethene	ug/L	<0.044	20	20	20.3	20.9	102	105	64-142	3	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	21.6	27.6	108	138	63-150	24	30		
Vinyl acetate	ug/L	<0.12	20	20	17.5	22.8	88	114	30-150	26	30		
Vinyl chloride	ug/L	<0.098	20	20	20.7	26.7	104	134	58-150	25	30		
Xylene (Total)	ug/L	<0.15	60	60	59.5	60.7	99	101	70-140	2	30		
1,2-Dichloroethane-d4 (S)	%						105	107	75-125				
4-Bromofluorobenzene (S)	%						100	97	75-125				
Toluene-d8 (S)	%						108	104	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10381429

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10381429

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Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10381429001	W26-GW-030917	EPA 8260B	463838		
10381429002	Trip Blank	EPA 8260B	463838		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10-381429

**Section A**

**Required Client Information:**  
 Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2m.com  
 Phone: [ ] Fax: [ ]  
 Requested Due Date/Circle: 24 Hr / 3 Day / 5 Day / 10 Day

**Section B**

**Required Project Information:**  
 Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #:  
 Project Name: UPRR Freeman  
 Project #: 1497

**Section C**

**Invoice Information:**  
 Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: CAS  
 Pace Quote:  
 Pace Project Manager:  
 Pace Profile #: 36447 / 3

Page: / Of /

Regulatory Agency  
 State / Location  
 WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX CODE Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives									Analyses Test Y/N	Requested Analysis Filtered (Y/N)						Residual Chlorine (Y/N)	
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	VOCs by 8260		Dry Weight							
						DATE	TIME	DATE	TIME																				
1	W26-GW-030917			WTG				3-7-17	9:00	9			X						X										Lab QC C01
2	Trip Blank			WTG				3-9-17		2			X						X										C02
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	[Signature]	3-9-17	15:00	[Signature]	3/10/17	10:30	0.6 Y Y Y


**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: Jamie Brown  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed: 3-9-17

TEMP in C  
 Received on Ice (Y/N)  
 Custody Sealed Cooler (Y/N)  
 Samples Intact (Y/N)

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name: CH2M Hill

Project #: **WO# : 10381429**



10381429

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7222 27398610

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 0.5      Cooler Temp Corrected (°C): 0.6      Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C      Correction Factor: 10.1      Date and Initials of Person Examining Contents: RL 3/10/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH      Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VDA pH is checked after analysis	Sample #
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>only 2 trip blanks</u>
Pace Trip Blank Lot # (if purchased): <u>110912</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Field Data Required?  Yes  No

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>11:25</u> Temp: <u>0.5</u>	Corrected Temp: <u>0.6</u>	
Time: <u>11:45</u> put in cooler		
Time: _____ Temp: _____	Corrected Temp: _____	

**Project Manager Review:**

JENNI GROSS Date: 03/10/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

April 07, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

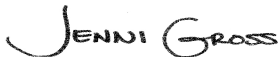
RE: Project: 661508 UPRR Freeman,WA  
Pace Project No.: 10383879

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10383879001	MW17D-GW55-040317	Water	04/03/17 14:15	04/05/17 10:00
10383879002	MW17D-GW75-040417	Water	04/04/17 07:55	04/05/17 10:00
10383879003	Trip-040317	Water	04/03/17 08:00	04/05/17 10:00
10383879004	MW17D-GW104-040417	Water	04/04/17 11:48	04/05/17 10:00

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### SAMPLE ANALYTE COUNT

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10383879001	MW17D-GW55-040317	EPA 8260B	DJB	83	PASI-M
10383879002	MW17D-GW75-040417	EPA 8260B	DJB	83	PASI-M
10383879003	Trip-040317	EPA 8260B	DJB	83	PASI-M
10383879004	MW17D-GW104-040417	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10383879001</b>	<b>MW17D-GW55-040317</b>					
EPA 8260B	4-Methyl-2-pentanone (MIBK)	1.3J	ug/L	5.0	04/07/17 00:35	
<b>10383879002</b>	<b>MW17D-GW75-040417</b>					
EPA 8260B	Carbon tetrachloride	1.8	ug/L	0.50	04/07/17 00:51	
EPA 8260B	Chloroform	0.22J	ug/L	1.0	04/07/17 00:51	
<b>10383879003</b>	<b>Trip-040317</b>					
EPA 8260B	Acetone	3.7J	ug/L	20.0	04/06/17 22:41	
EPA 8260B	Naphthalene	0.11J	ug/L	1.0	04/06/17 22:41	B
<b>10383879004</b>	<b>MW17D-GW104-040417</b>					
EPA 8260B	Carbon tetrachloride	45.7	ug/L	0.50	04/07/17 01:08	
EPA 8260B	Chloroform	1.7	ug/L	1.0	04/07/17 01:08	

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## PROJECT NARRATIVE

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** April 07, 2017

**General Information:**

4 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 467563

B: Analyte was detected in the associated method blank.

- BLANK for HBN 467563 [MSV/3938 (Lab ID: 2554392)
- Naphthalene

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 467563

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

Sample: **MW17D-GW55-040317** Lab ID: **10383879001** Collected: 04/03/17 14:15 Received: 04/05/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		04/07/17 00:35	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		04/07/17 00:35	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		04/07/17 00:35	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		04/07/17 00:35	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		04/07/17 00:35	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		04/07/17 00:35	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		04/07/17 00:35	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	1.0	0.082	1		04/07/17 00:35	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		04/07/17 00:35	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		04/07/17 00:35	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		04/07/17 00:35	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		04/07/17 00:35	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		04/07/17 00:35	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		04/07/17 00:35	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		04/07/17 00:35	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		04/07/17 00:35	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		04/05/17 23:10	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		04/07/17 00:35	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		04/07/17 00:35	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		04/07/17 00:35	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		04/07/17 00:35	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		04/07/17 00:35	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		04/07/17 00:35	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		04/07/17 00:35	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		04/07/17 00:35	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		04/07/17 00:35	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		04/07/17 00:35	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		04/07/17 00:35	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		04/07/17 00:35	106-43-4	
4-Methyl-2-pentanone (MIBK)	1.3J	ug/L	5.0	0.80	1		04/07/17 00:35	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		04/07/17 00:35	67-64-1	
Acrolein	<2.1	ug/L	40.0	2.1	1		04/07/17 00:35	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		04/07/17 00:35	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		04/07/17 00:35	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		04/07/17 00:35	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		04/07/17 00:35	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		04/07/17 00:35	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		04/07/17 00:35	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		04/07/17 00:35	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		04/07/17 00:35	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		04/07/17 00:35	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		04/07/17 00:35	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		04/07/17 00:35	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		04/07/17 00:35	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		04/07/17 00:35	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		04/07/17 00:35	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

**Sample: MW17D-GW55-040317**      **Lab ID: 10383879001**      Collected: 04/03/17 14:15      Received: 04/05/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		04/07/17 00:35	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		04/07/17 00:35	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		04/07/17 00:35	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		04/07/17 00:35	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		04/07/17 00:35	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		04/07/17 00:35	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		04/07/17 00:35	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		04/07/17 00:35	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		04/07/17 00:35	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		04/07/17 00:35	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		04/07/17 00:35	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		04/07/17 00:35	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		04/07/17 00:35	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		04/07/17 00:35	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		04/07/17 00:35	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		04/07/17 00:35	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		04/07/17 00:35	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		04/07/17 00:35	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		04/07/17 00:35	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		04/05/17 23:10	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		04/07/17 00:35	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		04/07/17 00:35	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		04/07/17 00:35	179601-23-1	
n-Butylbenzene	<0.16	ug/L	1.0	0.16	1		04/07/17 00:35	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		04/07/17 00:35	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		04/07/17 00:35	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	1.0	0.064	1		04/07/17 00:35	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		04/07/17 00:35	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		04/07/17 00:35	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		04/07/17 00:35	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		04/07/17 00:35	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		04/07/17 00:35	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		04/07/17 00:35	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		04/07/17 00:35	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-125		1		04/07/17 00:35	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		04/07/17 00:35	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		04/07/17 00:35	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

Sample: **MW17D-GW75-040417** Lab ID: **10383879002** Collected: 04/04/17 07:55 Received: 04/05/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		04/07/17 00:51	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		04/07/17 00:51	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		04/07/17 00:51	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		04/07/17 00:51	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		04/07/17 00:51	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		04/07/17 00:51	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		04/07/17 00:51	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	1.0	0.082	1		04/07/17 00:51	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		04/07/17 00:51	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		04/07/17 00:51	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		04/07/17 00:51	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		04/07/17 00:51	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		04/07/17 00:51	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		04/07/17 00:51	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		04/07/17 00:51	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		04/07/17 00:51	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		04/05/17 23:32	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		04/07/17 00:51	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		04/07/17 00:51	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		04/07/17 00:51	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		04/07/17 00:51	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		04/07/17 00:51	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		04/07/17 00:51	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		04/07/17 00:51	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		04/07/17 00:51	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		04/07/17 00:51	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		04/07/17 00:51	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		04/07/17 00:51	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		04/07/17 00:51	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		04/07/17 00:51	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		04/07/17 00:51	67-64-1	
Acrolein	<2.1	ug/L	40.0	2.1	1		04/07/17 00:51	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		04/07/17 00:51	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		04/07/17 00:51	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		04/07/17 00:51	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		04/07/17 00:51	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		04/07/17 00:51	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		04/07/17 00:51	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		04/07/17 00:51	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		04/07/17 00:51	75-15-0	
Carbon tetrachloride	1.8	ug/L	0.50	0.079	1		04/07/17 00:51	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		04/07/17 00:51	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		04/07/17 00:51	75-00-3	
Chloroform	0.22J	ug/L	1.0	0.21	1		04/07/17 00:51	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		04/07/17 00:51	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		04/07/17 00:51	124-48-1	

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### ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

**Sample: MW17D-GW75-040417**    **Lab ID: 10383879002**    Collected: 04/04/17 07:55    Received: 04/05/17 10:00    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		04/07/17 00:51	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		04/07/17 00:51	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		04/07/17 00:51	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		04/07/17 00:51	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		04/07/17 00:51	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		04/07/17 00:51	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		04/07/17 00:51	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		04/07/17 00:51	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		04/07/17 00:51	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		04/07/17 00:51	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		04/07/17 00:51	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		04/07/17 00:51	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		04/07/17 00:51	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		04/07/17 00:51	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		04/07/17 00:51	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		04/07/17 00:51	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		04/07/17 00:51	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		04/07/17 00:51	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		04/07/17 00:51	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		04/05/17 23:32	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		04/07/17 00:51	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		04/07/17 00:51	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		04/07/17 00:51	179601-23-1	
n-Butylbenzene	<0.16	ug/L	1.0	0.16	1		04/07/17 00:51	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		04/07/17 00:51	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		04/07/17 00:51	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	1.0	0.064	1		04/07/17 00:51	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		04/07/17 00:51	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		04/07/17 00:51	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		04/07/17 00:51	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		04/07/17 00:51	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		04/07/17 00:51	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		04/07/17 00:51	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		04/07/17 00:51	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-125		1		04/07/17 00:51	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1		04/07/17 00:51	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		04/07/17 00:51	460-00-4	

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## ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

**Sample: Trip-040317**      **Lab ID: 10383879003**      Collected: 04/03/17 08:00      Received: 04/05/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		04/06/17 22:41	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		04/06/17 22:41	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		04/06/17 22:41	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		04/06/17 22:41	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		04/06/17 22:41	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		04/06/17 22:41	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		04/06/17 22:41	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	1.0	0.082	1		04/06/17 22:41	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		04/06/17 22:41	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		04/06/17 22:41	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		04/06/17 22:41	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		04/06/17 22:41	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		04/06/17 22:41	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		04/06/17 22:41	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		04/06/17 22:41	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		04/06/17 22:41	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		04/05/17 19:51	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		04/06/17 22:41	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		04/06/17 22:41	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		04/06/17 22:41	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		04/06/17 22:41	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		04/06/17 22:41	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		04/06/17 22:41	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		04/06/17 22:41	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		04/06/17 22:41	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		04/06/17 22:41	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		04/06/17 22:41	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		04/06/17 22:41	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		04/06/17 22:41	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		04/06/17 22:41	108-10-1	
Acetone	3.7J	ug/L	20.0	0.64	1		04/06/17 22:41	67-64-1	
Acrolein	<2.1	ug/L	40.0	2.1	1		04/06/17 22:41	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		04/06/17 22:41	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		04/06/17 22:41	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		04/06/17 22:41	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		04/06/17 22:41	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		04/06/17 22:41	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		04/06/17 22:41	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		04/06/17 22:41	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		04/06/17 22:41	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		04/06/17 22:41	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		04/06/17 22:41	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		04/06/17 22:41	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		04/06/17 22:41	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		04/06/17 22:41	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		04/06/17 22:41	124-48-1	

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### ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

**Sample: Trip-040317**      **Lab ID: 10383879003**      Collected: 04/03/17 08:00      Received: 04/05/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		04/06/17 22:41	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		04/06/17 22:41	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		04/06/17 22:41	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		04/06/17 22:41	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		04/06/17 22:41	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		04/06/17 22:41	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		04/06/17 22:41	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		04/06/17 22:41	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		04/06/17 22:41	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		04/06/17 22:41	75-09-2	
Naphthalene	0.11J	ug/L	1.0	0.064	1		04/06/17 22:41	91-20-3	B
Styrene	<0.056	ug/L	0.50	0.056	1		04/06/17 22:41	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		04/06/17 22:41	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		04/06/17 22:41	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		04/06/17 22:41	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		04/06/17 22:41	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		04/06/17 22:41	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		04/06/17 22:41	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		04/06/17 22:41	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		04/05/17 19:51	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		04/06/17 22:41	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		04/06/17 22:41	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		04/06/17 22:41	179601-23-1	
n-Butylbenzene	<0.16	ug/L	1.0	0.16	1		04/06/17 22:41	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		04/06/17 22:41	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		04/06/17 22:41	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	1.0	0.064	1		04/06/17 22:41	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		04/06/17 22:41	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		04/06/17 22:41	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		04/06/17 22:41	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		04/06/17 22:41	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		04/06/17 22:41	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		04/06/17 22:41	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		04/06/17 22:41	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-125		1		04/06/17 22:41	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		04/06/17 22:41	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		04/06/17 22:41	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

Sample: MW17D-GW104-040417 Lab ID: 10383879004 Collected: 04/04/17 11:48 Received: 04/05/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		04/07/17 01:08	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		04/07/17 01:08	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		04/07/17 01:08	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		04/07/17 01:08	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		04/07/17 01:08	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		04/07/17 01:08	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		04/07/17 01:08	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	1.0	0.082	1		04/07/17 01:08	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		04/07/17 01:08	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		04/07/17 01:08	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		04/07/17 01:08	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		04/07/17 01:08	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		04/07/17 01:08	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		04/07/17 01:08	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		04/07/17 01:08	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		04/07/17 01:08	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		04/05/17 23:54	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		04/07/17 01:08	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		04/07/17 01:08	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		04/07/17 01:08	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		04/07/17 01:08	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		04/07/17 01:08	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		04/07/17 01:08	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		04/07/17 01:08	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		04/07/17 01:08	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		04/07/17 01:08	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		04/07/17 01:08	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		04/07/17 01:08	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		04/07/17 01:08	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		04/07/17 01:08	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		04/07/17 01:08	67-64-1	
Acrolein	<2.1	ug/L	40.0	2.1	1		04/07/17 01:08	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		04/07/17 01:08	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		04/07/17 01:08	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		04/07/17 01:08	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		04/07/17 01:08	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		04/07/17 01:08	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		04/07/17 01:08	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		04/07/17 01:08	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		04/07/17 01:08	75-15-0	
Carbon tetrachloride	45.7	ug/L	0.50	0.079	1		04/07/17 01:08	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		04/07/17 01:08	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		04/07/17 01:08	75-00-3	
Chloroform	1.7	ug/L	1.0	0.21	1		04/07/17 01:08	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		04/07/17 01:08	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		04/07/17 01:08	124-48-1	

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## ANALYTICAL RESULTS

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

**Sample: MW17D-GW104-040417**    **Lab ID: 10383879004**    Collected: 04/04/17 11:48    Received: 04/05/17 10:00    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		04/07/17 01:08	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		04/07/17 01:08	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		04/07/17 01:08	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		04/07/17 01:08	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		04/07/17 01:08	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		04/07/17 01:08	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		04/07/17 01:08	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		04/07/17 01:08	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		04/07/17 01:08	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		04/07/17 01:08	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		04/07/17 01:08	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		04/07/17 01:08	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		04/07/17 01:08	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		04/07/17 01:08	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		04/07/17 01:08	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		04/07/17 01:08	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		04/07/17 01:08	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		04/07/17 01:08	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		04/07/17 01:08	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		04/05/17 23:54	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		04/07/17 01:08	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		04/07/17 01:08	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		04/07/17 01:08	179601-23-1	
n-Butylbenzene	<0.16	ug/L	1.0	0.16	1		04/07/17 01:08	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		04/07/17 01:08	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		04/07/17 01:08	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	1.0	0.064	1		04/07/17 01:08	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		04/07/17 01:08	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		04/07/17 01:08	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		04/07/17 01:08	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		04/07/17 01:08	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		04/07/17 01:08	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		04/07/17 01:08	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		04/07/17 01:08	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-125		1		04/07/17 01:08	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		04/07/17 01:08	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		04/07/17 01:08	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

QC Batch: 467212 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10383879001, 10383879002, 10383879003, 10383879004

METHOD BLANK: 2552592 Matrix: Water  
 Associated Lab Samples: 10383879001, 10383879002, 10383879003, 10383879004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	04/05/17 18:45	
Xylene (Total)	ug/L	<0.15	1.5	0.15	04/05/17 18:45	
1,2-Dichloroethane-d4 (S)	%	103	75-125		04/05/17 18:45	
4-Bromofluorobenzene (S)	%	101	75-125		04/05/17 18:45	
Toluene-d8 (S)	%	100	75-125		04/05/17 18:45	

LABORATORY CONTROL SAMPLE: 2552593

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethene (Total)	ug/L	40	44.7	112	75-125	
Xylene (Total)	ug/L	60	65.2	109	75-125	
1,2-Dichloroethane-d4 (S)	%			102	75-125	
4-Bromofluorobenzene (S)	%			102	75-125	
Toluene-d8 (S)	%			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2552619 2552620

Parameter	Units	10383786001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
1,2-Dichloroethene (Total)	ug/L	ND	40	40	43.3	41.9	108	105	55-146	3	30	
Xylene (Total)	ug/L	ND	60	60	63.2	62.4	105	104	70-140	1	30	
1,2-Dichloroethane-d4 (S)	%						102	101	75-125			
4-Bromofluorobenzene (S)	%						102	101	75-125			
Toluene-d8 (S)	%						101	103	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

QC Batch: 467563 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10383879001, 10383879002, 10383879003, 10383879004

METHOD BLANK: 2554392 Matrix: Water  
Associated Lab Samples: 10383879001, 10383879002, 10383879003, 10383879004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	04/06/17 22:25	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	04/06/17 22:25	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	04/06/17 22:25	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	04/06/17 22:25	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	04/06/17 22:25	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	04/06/17 22:25	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	04/06/17 22:25	
1,1-Dichloropropene	ug/L	<0.082	1.0	0.082	04/06/17 22:25	MN
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	04/06/17 22:25	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	04/06/17 22:25	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	04/06/17 22:25	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	04/06/17 22:25	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	04/06/17 22:25	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	04/06/17 22:25	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	04/06/17 22:25	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	04/06/17 22:25	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	04/06/17 22:25	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	04/06/17 22:25	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	04/06/17 22:25	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	04/06/17 22:25	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	04/06/17 22:25	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	04/06/17 22:25	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	04/06/17 22:25	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	04/06/17 22:25	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	04/06/17 22:25	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	04/06/17 22:25	
2-Hexanone	ug/L	<0.19	5.0	0.19	04/06/17 22:25	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	04/06/17 22:25	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	04/06/17 22:25	
Acetone	ug/L	<0.64	20.0	0.64	04/06/17 22:25	
Acrolein	ug/L	<2.1	40.0	2.1	04/06/17 22:25	MN
Acrylonitrile	ug/L	<0.49	10.0	0.49	04/06/17 22:25	
Benzene	ug/L	<0.042	0.50	0.042	04/06/17 22:25	
Bromobenzene	ug/L	<0.087	0.50	0.087	04/06/17 22:25	
Bromochloromethane	ug/L	<0.082	1.0	0.082	04/06/17 22:25	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	04/06/17 22:25	
Bromoform	ug/L	<0.11	4.0	0.11	04/06/17 22:25	
Bromomethane	ug/L	<0.20	4.0	0.20	04/06/17 22:25	
Carbon disulfide	ug/L	<0.20	1.0	0.20	04/06/17 22:25	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	04/06/17 22:25	
Chlorobenzene	ug/L	<0.066	0.50	0.066	04/06/17 22:25	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

METHOD BLANK: 2554392

Matrix: Water

Associated Lab Samples: 10383879001, 10383879002, 10383879003, 10383879004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloroethane	ug/L	<0.12	1.0	0.12	04/06/17 22:25	
Chloroform	ug/L	<0.21	1.0	0.21	04/06/17 22:25	
Chloromethane	ug/L	<0.080	4.0	0.080	04/06/17 22:25	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	04/06/17 22:25	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	04/06/17 22:25	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	04/06/17 22:25	
Dibromomethane	ug/L	<0.14	1.0	0.14	04/06/17 22:25	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	04/06/17 22:25	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	04/06/17 22:25	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	04/06/17 22:25	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	04/06/17 22:25	
Ethylbenzene	ug/L	<0.075	0.50	0.075	04/06/17 22:25	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	04/06/17 22:25	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	04/06/17 22:25	
m&p-Xylene	ug/L	<0.11	1.0	0.11	04/06/17 22:25	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	04/06/17 22:25	
Methylene Chloride	ug/L	<0.097	4.0	0.097	04/06/17 22:25	
n-Butylbenzene	ug/L	<0.16	1.0	0.16	04/06/17 22:25	MN
n-Propylbenzene	ug/L	<0.049	0.50	0.049	04/06/17 22:25	
Naphthalene	ug/L	0.19J	1.0	0.064	04/06/17 22:25	
o-Xylene	ug/L	<0.044	0.50	0.044	04/06/17 22:25	
p-Isopropyltoluene	ug/L	<0.064	1.0	0.064	04/06/17 22:25	MN
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	04/06/17 22:25	
Styrene	ug/L	<0.056	0.50	0.056	04/06/17 22:25	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	04/06/17 22:25	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	04/06/17 22:25	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	04/06/17 22:25	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	04/06/17 22:25	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	04/06/17 22:25	
Toluene	ug/L	<0.059	0.50	0.059	04/06/17 22:25	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	04/06/17 22:25	
trans-1,3-Dichloropropene	ug/L	<0.044	1.0	0.044	04/06/17 22:25	MN
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	04/06/17 22:25	
Trichloroethene	ug/L	<0.044	0.40	0.044	04/06/17 22:25	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	04/06/17 22:25	
Vinyl acetate	ug/L	<0.12	10.0	0.12	04/06/17 22:25	
Vinyl chloride	ug/L	<0.098	0.20	0.098	04/06/17 22:25	
1,2-Dichloroethane-d4 (S)	%	98	75-125		04/06/17 22:25	
4-Bromofluorobenzene (S)	%	100	75-125		04/06/17 22:25	
Toluene-d8 (S)	%	98	75-125		04/06/17 22:25	

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

LABORATORY CONTROL SAMPLE & LCSD: 2554393		2554394									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	21.4	21.8	107	109	75-125	2	30		
1,1,1-Trichloroethane	ug/L	20	21.8	22.0	109	110	74-125	1	30		
1,1,2,2-Tetrachloroethane	ug/L	20	19.9	19.9	99	100	67-131	0	30		
1,1,2-Trichloroethane	ug/L	20	19.1	20.2	95	101	75-125	6	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.6	21.0	108	105	75-125	3	30		
1,1-Dichloroethane	ug/L	20	19.6	18.9	98	95	74-125	4	30		
1,1-Dichloroethene	ug/L	20	21.8	21.6	109	108	74-125	1	30		
1,1-Dichloropropene	ug/L	20	20.8	20.8	104	104	74-125	0	30		
1,2,3-Trichlorobenzene	ug/L	20	20.9	21.1	104	105	63-131	1	30		
1,2,3-Trichloropropane	ug/L	20	20.4	20.5	102	103	73-125	1	30		
1,2,4-Trichlorobenzene	ug/L	20	21.4	21.4	107	107	66-126	0	30		
1,2,4-Trimethylbenzene	ug/L	20	21.6	21.8	108	109	74-129	1	30		
1,2-Dibromo-3-chloropropane	ug/L	50	49.1	50.9	98	102	54-129	4	30		
1,2-Dibromoethane (EDB)	ug/L	20	19.8	20.5	99	103	75-125	4	30		
1,2-Dichlorobenzene	ug/L	20	20.4	20.5	102	103	75-125	0	30		
1,2-Dichloroethane	ug/L	20	18.9	18.7	94	94	75-125	1	30		
1,2-Dichloropropane	ug/L	20	18.1	17.5	90	87	75-125	3	30		
1,3,5-Trimethylbenzene	ug/L	20	21.6	21.6	108	108	73-127	0	30		
1,3-Dichlorobenzene	ug/L	20	20.3	20.6	101	103	75-125	2	30		
1,3-Dichloropropane	ug/L	20	20.1	19.8	100	99	69-125	2	30		
1,4-Dichlorobenzene	ug/L	20	19.5	19.1	97	95	75-125	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	408	398	102	99	70-130	3	30		
2,2,4-Trimethylpentane	ug/L	20	19.5	19.2	98	96	67-138	2	30		
2,2-Dichloropropane	ug/L	20	20.2	18.8	101	94	69-125	7	30		
2-Butanone (MEK)	ug/L	100	91.3	87.5	91	88	48-145	4	30		
2-Chlorotoluene	ug/L	20	21.0	21.1	105	105	74-125	1	30		
2-Hexanone	ug/L	100	103	104	103	104	63-135	1	30		
4-Chlorotoluene	ug/L	20	20.4	20.8	102	104	73-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.9	99.1	98	99	53-138	1	30		
Acetone	ug/L	100	109	109	109	109	70-142	1	30		
Acrolein	ug/L	200	191	227	96	113	44-150	17	30		
Acrylonitrile	ug/L	200	184	181	92	90	68-125	2	30		
Benzene	ug/L	20	19.8	19.4	99	97	65-125	2	30		
Bromobenzene	ug/L	20	21.0	21.2	105	106	75-125	1	30		
Bromochloromethane	ug/L	20	20.6	20.5	103	103	75-125	0	30		
Bromodichloromethane	ug/L	20	21.2	20.5	106	103	73-125	3	30		
Bromoform	ug/L	20	21.0	21.0	105	105	69-125	0	30		
Bromomethane	ug/L	20	18.3	19.7	91	98	40-136	7	30		
Carbon disulfide	ug/L	20	19.1	19.0	95	95	36-150	0	30		
Carbon tetrachloride	ug/L	20	20.2	19.6	101	98	70-125	3	30		
Chlorobenzene	ug/L	20	20.4	20.5	102	103	75-125	0	30		
Chloroethane	ug/L	20	22.6	20.7	113	103	67-141	9	30		
Chloroform	ug/L	20	20.1	19.4	101	97	75-125	4	30		
Chloromethane	ug/L	20	17.9	17.1	90	85	50-150	5	30		
cis-1,2-Dichloroethene	ug/L	20	19.2	18.5	96	93	75-125	4	30		
cis-1,3-Dichloropropene	ug/L	20	20.8	20.5	104	102	75-125	2	30		
Dibromochloromethane	ug/L	20	20.2	20.9	101	105	75-125	3	30		

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

LABORATORY CONTROL SAMPLE & LCSD: 2554393		2554394								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromomethane	ug/L	20	20.2	20.3	101	101	75-129	0	30	
Dichlorodifluoromethane	ug/L	20	18.1	17.3	91	87	59-135	4	30	
Dichlorofluoromethane	ug/L	20	20.4	20.2	102	101	74-130	1	30	
Diisopropyl ether	ug/L	20	19.4	18.9	97	95	71-125	2	30	
Ethyl-tert-butyl ether	ug/L	20	20.2	20.6	101	103	70-130	2	30	
Ethylbenzene	ug/L	20	19.3	19.6	96	98	75-125	2	30	
Hexachloro-1,3-butadiene	ug/L	20	18.8	18.5	94	93	72-126	2	30	
Isopropylbenzene (Cumene)	ug/L	20	21.1	21.6	106	108	71-136	2	30	
m&p-Xylene	ug/L	40	41.3	41.6	103	104	75-125	1	30	
Methyl-tert-butyl ether	ug/L	20	19.8	20.5	99	103	73-127	4	30	
Methylene Chloride	ug/L	20	19.4	18.2	97	91	68-128	6	30	
n-Butylbenzene	ug/L	20	21.2	21.3	106	107	70-126	1	30	
n-Propylbenzene	ug/L	20	20.9	20.8	105	104	67-131	1	30	
Naphthalene	ug/L	20	19.9	20.1	100	101	52-134	1	30	
o-Xylene	ug/L	20	20.9	21.5	105	107	75-125	2	30	
p-Isopropyltoluene	ug/L	20	21.9	22.1	109	110	74-125	1	30	
sec-Butylbenzene	ug/L	20	22.3	21.8	111	109	69-134	2	30	
Styrene	ug/L	20	20.8	21.1	104	105	75-125	2	30	
tert-Amylmethyl ether	ug/L	20	20.0	20.3	100	101	70-130	2	30	
tert-Butyl Alcohol	ug/L	200	179	186	89	93	66-128	4	30	
tert-Butylbenzene	ug/L	20	21.1	21.2	105	106	71-128	0	30	
Tetrachloroethene	ug/L	20	21.2	21.5	106	107	74-125	2	30	
Tetrahydrofuran	ug/L	200	220	218	110	109	64-142	1	30	
Toluene	ug/L	20	19.5	19.8	98	99	75-125	1	30	
trans-1,2-Dichloroethene	ug/L	20	19.1	19.0	96	95	73-125	1	30	
trans-1,3-Dichloropropene	ug/L	20	19.7	21.0	98	105	75-125	7	30	
trans-1,4-Dichloro-2-butene	ug/L	50	52.6	51.7	105	103	54-133	2	30	
Trichloroethene	ug/L	20	21.0	20.7	105	104	75-125	2	30	
Trichlorofluoromethane	ug/L	20	20.4	19.9	102	100	75-126	2	30	
Vinyl acetate	ug/L	20	18.5	18.4	93	92	67-126	1	30	
Vinyl chloride	ug/L	20	21.0	20.5	105	102	72-125	3	30	
1,2-Dichloroethane-d4 (S)	%				98	99	75-125			
4-Bromofluorobenzene (S)	%				102	102	75-125			
Toluene-d8 (S)	%				99	101	75-125			

MATRIX SPIKE SAMPLE: 2554395		10383880001		Spike		MS		% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	MS % Rec	Limits	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20.9	105	75-127			
1,1,1-Trichloroethane	ug/L	<0.057	20	22.4	112	66-142			
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	19.1	95	70-131			
1,1,2-Trichloroethane	ug/L	<0.064	20	18.6	93	75-128			
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	23.0	115	54-150			
1,1-Dichloroethane	ug/L	<0.055	20	19.6	98	58-147			
1,1-Dichloroethene	ug/L	<0.069	20	22.7	114	49-150			

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

MATRIX SPIKE SAMPLE:	2554395	10383880001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloropropene	ug/L	<0.082	20	21.3	107	58-147	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	19.7	98	57-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	19.3	96	71-127	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	19.8	99	55-136	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20.8	104	67-138	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	48.2	96	63-136	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	18.3	92	74-125	
1,2-Dichlorobenzene	ug/L	<0.078	20	19.3	97	75-125	
1,2-Dichloroethane	ug/L	<0.072	20	17.8	89	63-133	
1,2-Dichloropropane	ug/L	<0.066	20	17.8	89	63-138	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	21.2	106	69-136	
1,3-Dichlorobenzene	ug/L	<0.085	20	19.0	95	75-125	
1,3-Dichloropropane	ug/L	<0.059	20	19.2	96	65-135	
1,4-Dichlorobenzene	ug/L	<0.081	20	18.6	93	70-126	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	407	102	54-145	
2,2,4-Trimethylpentane	ug/L	<0.087	20	20.9	105	30-150	
2,2-Dichloropropane	ug/L	<0.096	20	20.2	101	39-148	
2-Butanone (MEK)	ug/L	<1.1	100	86.0	86	50-144	
2-Chlorotoluene	ug/L	<0.084	20	20.6	103	71-135	
2-Hexanone	ug/L	<0.19	100	96.5	96	43-150	
4-Chlorotoluene	ug/L	<0.048	20	20.2	101	71-131	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	95.2	95	60-147	
Acetone	ug/L	<0.64	100	84.3	84	59-150	
Acrolein	ug/L	<2.1	200	323	161	30-150 M1	
Acrylonitrile	ug/L	<0.49	200	181	90	41-148	
Benzene	ug/L	<0.042	20	19.2	96	61-138	
Bromobenzene	ug/L	<0.087	20	19.8	99	74-130	
Bromochloromethane	ug/L	<0.082	20	18.9	95	65-137	
Bromodichloromethane	ug/L	<0.068	20	20.8	104	66-136	
Bromoform	ug/L	<0.11	20	19.7	98	71-125	
Bromomethane	ug/L	<0.20	20	20.3	101	30-150	
Carbon disulfide	ug/L	<0.20	20	20.1	100	30-150	
Carbon tetrachloride	ug/L	<0.079	20	21.6	108	68-140	
Chlorobenzene	ug/L	<0.066	20	20.5	102	75-132	
Chloroethane	ug/L	<0.12	20	21.4	107	55-150	
Chloroform	ug/L	<0.21	20	20.1	100	64-139	
Chloromethane	ug/L	<0.080	20	17.9	89	73-150	
cis-1,2-Dichloroethene	ug/L	<0.12	20	18.9	95	62-138	
cis-1,3-Dichloropropene	ug/L	<0.069	20	19.9	99	70-125	
Dibromochloromethane	ug/L	<0.048	20	20.0	100	74-125	
Dibromomethane	ug/L	<0.14	20	19.9	99	66-138	
Dichlorodifluoromethane	ug/L	<0.075	20	19.5	98	53-150	
Dichlorofluoromethane	ug/L	<0.054	20	20.4	102	58-150	
Diisopropyl ether	ug/L	<0.050	20	18.4	92	50-139	
Ethyl-tert-butyl ether	ug/L	<0.062	20	19.8	99	30-140	
Ethylbenzene	ug/L	<0.075	20	19.4	97	66-141	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	19.0	95	63-139	

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

MATRIX SPIKE SAMPLE: 2554395		10383880001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Isopropylbenzene (Cumene)	ug/L	<0.064	20	21.4	107	65-146	
m&p-Xylene	ug/L	<0.11	40	40.4	101	72-142	
Methyl-tert-butyl ether	ug/L	<0.047	20	19.0	95	63-134	
Methylene Chloride	ug/L	<0.097	20	17.9	90	49-143	
n-Butylbenzene	ug/L	<0.16	20	21.0	105	67-134	
n-Propylbenzene	ug/L	<0.049	20	20.3	101	62-142	
Naphthalene	ug/L	<0.064	20	19.6	98	41-150	
o-Xylene	ug/L	<0.044	20	21.2	106	66-138	
p-Isopropyltoluene	ug/L	<0.064	20	21.6	108	64-137	
sec-Butylbenzene	ug/L	<0.094	20	21.8	109	65-142	
Styrene	ug/L	<0.056	20	20.1	101	61-142	
tert-Amylmethyl ether	ug/L	<0.073	20	19.3	97	65-125	
tert-Butyl Alcohol	ug/L	<0.89	200	172	86	59-138	
tert-Butylbenzene	ug/L	<0.051	20	20.9	105	69-135	
Tetrachloroethene	ug/L	<0.13	20	21.5	108	62-142	
Tetrahydrofuran	ug/L	<1.5	200	208	104	55-150	
Toluene	ug/L	<0.059	20	18.7	93	66-132	
trans-1,2-Dichloroethene	ug/L	<0.15	20	20.1	101	48-150	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20.2	101	65-130	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50.8	102	31-150	
Trichloroethene	ug/L	<0.044	20	20.6	103	64-142	
Trichlorofluoromethane	ug/L	<0.055	20	21.3	106	63-150	
Vinyl acetate	ug/L	<0.12	20	17.3	86	30-150	
Vinyl chloride	ug/L	<0.098	20	21.3	106	58-150	
1,2-Dichloroethane-d4 (S)	%				98	75-125	
4-Bromofluorobenzene (S)	%				98	75-125	
Toluene-d8 (S)	%				100	75-125	

SAMPLE DUPLICATE: 2554396

Parameter	Units	10383880002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

SAMPLE DUPLICATE: 2554396

Parameter	Units	10383880002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	<1.1	<1.1		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	<0.64	<0.64		30	
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	<0.20	<0.20		30	
Carbon tetrachloride	ug/L	<0.079	<0.079		30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	<0.21	<0.21		30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	<0.064	<0.064		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

SAMPLE DUPLICATE: 2554396

Parameter	Units	10383880002 Result	Dup Result	RPD	Max RPD	Qualifiers
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	<0.059	<0.059		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
1,2-Dichloroethane-d4 (S)	%	97	99	2		
4-Bromofluorobenzene (S)	%	98	100	2		
Toluene-d8 (S)	%	98	97	2		

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## QUALIFIERS

Project: 661508 UPRR Freeman,WA

Pace Project No.: 10383879

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 467563

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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### METHOD CROSS REFERENCE TABLE

Project: 661508 UPRR Freeman,WA  
Pace Project No.: 10383879

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 661508 UPRR Freeman, WA

Pace Project No.: 10383879

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10383879001	MW17D-GW55-040317	EPA 8260B	467212		
10383879001	MW17D-GW55-040317	EPA 8260B	467563		
10383879002	MW17D-GW75-040417	EPA 8260B	467212		
10383879002	MW17D-GW75-040417	EPA 8260B	467563		
10383879003	Trip-040317	EPA 8260B	467212		
10383879003	Trip-040317	EPA 8260B	467563		
10383879004	MW17D-GW104-040417	EPA 8260B	467212		
10383879004	MW17D-GW104-040417	EPA 8260B	467563		

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**CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

16983879

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	Page: <u>  </u> of <u>  </u>
Company: <u>CH2M</u>	Report To: <u>Steve Demus</u>	Attention:	2106892
Address: <u>999 W Riverside Ave Suite 500</u>	Copy To: <u>Mark Ochsner</u>	Company Name:	<b>REGULATORY AGENCY</b>
Email To:	Purchase Order No.:	Address:	<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER
Phone: <u>510 316 2323</u> Fax:	Project Name: <u>UPRR Freeman, WA</u>	Pace Quote Reference:	<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____
Requested Due Date/TAT: <u>3 day TAT</u>	Project Number: <u>661508</u>	Pace Project Manager:	Site Location:
		Pace Profile #: <u>36447 #1</u>	STATE: _____

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Code (see valid codes to left)	Sample Type (G=GRAB C=COMP)	COLLECTED				Sample Temp at Collection	# of Containers	Preservatives							Analysis Test ↓ 8260B	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.				
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol		Other	↓																
					DATE	TIME	DATE	TIME																												
1	MW17D-GW55-040317	WT	G						3				X																							CO1
2	MW17D-GW75-040417	WT	G						3				X																						CO2	
3	TRIP-040317	WT	G						2				X																						CO3	
4	<del>MW17D-GW104-040417</del>	<del>WT</del>	<del>G</del>						<del>3</del>				<del>X</del>																							
5	MW17D-GW104-040417	WT	G						3				X																							CO4

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)
	<u>ZLIS/CH2M</u>	<u>4/4/17</u>	<u>1459</u>	<u>Mark Ochsner / PACE</u>	<u>4/5/17</u>	<u>1000.09</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>

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ORIGINAL

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	<u>Ron McComb</u>	DATE Signed (MM/DD/YY):	<u>04/04/17</u>
SIGNATURE of SAMPLER:	<u>Ronald McComb</u>		

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M/UPRR      **Project #:** WO# : 10383879



**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     SpeedDee     Other: \_\_\_\_\_  
**Tracking Number:** 7096 3372 3510

**Custody Seal on Cooler/Box Present?**  Yes     No      **Seals Intact?**  Yes     No      **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**  Yes     No  
**Thermometer Used:**  151401163     151401164      **Type of Ice:**  Wet     Blue     None     Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 0.7      **Cooler Temp Corrected (°C):** 0.9      **Biological Tissue Frozen?**  Yes     No     NA  
Temp should be above freezing to 6°C      **Correction Factor:** 10.2      **Date and Initials of Person Examining Contents:** CSG 4/5/17

**USDA Regulated Soil** (  N/A, water sample)  
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions <u>VOA</u> Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Per method, VOA pH is checked after analysis	
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>2 trip blanks present</u>
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**  Yes     No  
Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>14:10</u>	Temp: <u>0.7</u>	Corrected Temp: <u>0.9</u>
Time: <u>14:15</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Comments/Resolution:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Project Manager Review:** JENNI GROSS      **Date:** 04/05/17  
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

April 24, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on April 12, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10384673001	SB44-SS-05	Solid	04/07/17 09:10	04/12/17 11:15
10384673002	SB44-SS-10	Solid	04/07/17 09:20	04/12/17 11:15
10384673003	SB44-SS-15	Solid	04/07/17 09:30	04/12/17 11:15
10384673004	SB44-SS-20	Solid	04/07/17 09:40	04/12/17 11:15
10384673005	SB44-SS-25	Solid	04/07/17 09:45	04/12/17 11:15
10384673006	SB44-SS-30	Solid	04/07/17 10:05	04/12/17 11:15
10384673007	SB44-SS-35	Solid	04/07/17 10:10	04/12/17 11:15
10384673008	SB44-SS-40	Solid	04/07/17 10:25	04/12/17 11:15
10384673009	SB44-SS-45	Solid	04/07/17 10:20	04/12/17 11:15
10384673010	SB44-SS-50	Solid	04/07/17 10:45	04/12/17 11:15
10384673011	SB44-SS-55	Solid	04/07/17 10:50	04/12/17 11:15
10384673012	SB44-SS-60	Solid	04/07/17 11:15	04/12/17 11:15
10384673013	SB44-SS-65	Solid	04/07/17 11:20	04/12/17 11:15
10384673014	SB44-SS-70	Solid	04/07/17 11:50	04/12/17 11:15
10384673015	SB44-SS-73	Solid	04/07/17 11:55	04/12/17 11:15
10384673016	FD1-SS-040717	Solid	04/07/17 17:00	04/12/17 11:15
10384673017	Trip Blank	Solid	04/07/17 00:00	04/12/17 11:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10384673001	SB44-SS-05	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673002	SB44-SS-10	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673003	SB44-SS-15	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673004	SB44-SS-20	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673005	SB44-SS-25	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673006	SB44-SS-30	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673007	SB44-SS-35	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673008	SB44-SS-40	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673009	SB44-SS-45	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673010	SB44-SS-50	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673011	SB44-SS-55	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673012	SB44-SS-60	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673013	SB44-SS-65	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673014	SB44-SS-70	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10384673015	SB44-SS-73	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	MRB	51	PASI-M
10384673016	FD1-SS-040717	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	MRB	51	PASI-M
10384673017	Trip Blank	EPA 8260B	CD2	51	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10384673001</b>	<b>SB44-SS-05</b>					
ASTM D2974	Percent Moisture	17.8	%	0.10	04/18/17 13:16	
<b>10384673002</b>	<b>SB44-SS-10</b>					
ASTM D2974	Percent Moisture	18.3	%	0.10	04/18/17 13:16	
<b>10384673003</b>	<b>SB44-SS-15</b>					
ASTM D2974	Percent Moisture	26.9	%	0.10	04/18/17 13:16	
<b>10384673004</b>	<b>SB44-SS-20</b>					
ASTM D2974	Percent Moisture	30.6	%	0.10	04/18/17 13:16	
<b>10384673005</b>	<b>SB44-SS-25</b>					
ASTM D2974	Percent Moisture	19.1	%	0.10	04/18/17 13:16	
<b>10384673006</b>	<b>SB44-SS-30</b>					
ASTM D2974	Percent Moisture	30.1	%	0.10	04/18/17 13:17	
<b>10384673007</b>	<b>SB44-SS-35</b>					
ASTM D2974	Percent Moisture	29.6	%	0.10	04/18/17 13:17	
<b>10384673008</b>	<b>SB44-SS-40</b>					
ASTM D2974	Percent Moisture	25.6	%	0.10	04/18/17 13:17	
<b>10384673009</b>	<b>SB44-SS-45</b>					
ASTM D2974	Percent Moisture	21.5	%	0.10	04/18/17 13:17	
<b>10384673010</b>	<b>SB44-SS-50</b>					
ASTM D2974	Percent Moisture	28.1	%	0.10	04/18/17 13:17	
<b>10384673011</b>	<b>SB44-SS-55</b>					
ASTM D2974	Percent Moisture	26.7	%	0.10	04/18/17 13:18	
<b>10384673012</b>	<b>SB44-SS-60</b>					
ASTM D2974	Percent Moisture	28.8	%	0.10	04/18/17 13:18	
<b>10384673013</b>	<b>SB44-SS-65</b>					
ASTM D2974	Percent Moisture	34.4	%	0.10	04/18/17 13:18	
<b>10384673014</b>	<b>SB44-SS-70</b>					
ASTM D2974	Percent Moisture	35.3	%	0.10	04/18/17 13:18	
<b>10384673015</b>	<b>SB44-SS-73</b>					
ASTM D2974	Percent Moisture	11.5	%	0.10	04/18/17 14:22	
EPA 8260B	Methylene Chloride	806	ug/kg	695	04/14/17 21:15	
<b>10384673016</b>	<b>FD1-SS-040717</b>					
ASTM D2974	Percent Moisture	23.3	%	0.10	04/18/17 14:22	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

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**Method:** EPA 8260B

**Description:** 8260B MSV 5030 Med Level

**Client:** UPRR\_CH2M Hill

**Date:** April 24, 2017

### General Information:

17 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 468435

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2558270)
  - Trichlorofluoromethane
- LCSD (Lab ID: 2558271)
  - Trichlorofluoromethane
- MS (Lab ID: 2558272)
  - Trichlorofluoromethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 468435

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2558271)
  - Acetone

QC Batch: 468660

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

- LCS (Lab ID: 2559441)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

---

**Method:** EPA 8260B

**Description:** 8260B MSV 5030 Med Level

**Client:** UPRR\_CH2M Hill

**Date:** April 24, 2017

QC Batch: 468660

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

- Acetone

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 468435

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10384733001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2558272)
  - 1,1,2,2-Tetrachloroethane
  - Vinyl acetate

QC Batch: 468436

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10384673011

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2558276)
  - Dichlorodifluoromethane
- MSD (Lab ID: 2558277)
  - Dichlorodifluoromethane

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-05**      **Lab ID: 10384673001**      Collected: 04/07/17 09:10      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>17.8</b>	%	0.10	0.10	1		04/18/17 13:16		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;23.8</b>	ug/kg	56.9	23.8	1	04/14/17 11:00	04/15/17 06:11	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;12.6</b>	ug/kg	56.9	12.6	1	04/14/17 11:00	04/15/17 06:11	79-34-5	
1,1,2-Trichloroethane	<b>&lt;12.3</b>	ug/kg	56.9	12.3	1	04/14/17 11:00	04/15/17 06:11	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;41.0</b>	ug/kg	228	41.0	1	04/14/17 11:00	04/15/17 06:11	76-13-1	
1,1-Dichloroethane	<b>&lt;22.1</b>	ug/kg	56.9	22.1	1	04/14/17 11:00	04/15/17 06:11	75-34-3	
1,1-Dichloroethene	<b>&lt;14.5</b>	ug/kg	56.9	14.5	1	04/14/17 11:00	04/15/17 06:11	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;17.5</b>	ug/kg	56.9	17.5	1	04/14/17 11:00	04/15/17 06:11	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;12.5</b>	ug/kg	56.9	12.5	1	04/14/17 11:00	04/15/17 06:11	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;21.4</b>	ug/kg	56.9	21.4	1	04/14/17 11:00	04/15/17 06:11	106-93-4	
1,2-Dichlorobenzene	<b>&lt;11.0</b>	ug/kg	56.9	11.0	1	04/14/17 11:00	04/15/17 06:11	95-50-1	
1,2-Dichloroethane	<b>&lt;18.0</b>	ug/kg	56.9	18.0	1	04/14/17 11:00	04/15/17 06:11	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;13.1</b>	ug/kg	56.9	13.1	1	04/14/17 11:00	04/15/17 06:11	108-67-8	
1,3-Dichlorobenzene	<b>&lt;16.7</b>	ug/kg	56.9	16.7	1	04/14/17 11:00	04/15/17 06:11	541-73-1	
1,4-Dichlorobenzene	<b>&lt;16.5</b>	ug/kg	56.9	16.5	1	04/14/17 11:00	04/15/17 06:11	106-46-7	
2-Butanone (MEK)	<b>&lt;75.2</b>	ug/kg	285	75.2	1	04/14/17 11:00	04/15/17 06:11	78-93-3	
2-Hexanone	<b>&lt;67.1</b>	ug/kg	285	67.1	1	04/14/17 11:00	04/15/17 06:11	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;37.7</b>	ug/kg	285	37.7	1	04/14/17 11:00	04/15/17 06:11	108-10-1	
Acetone	<b>&lt;374</b>	ug/kg	1140	374	1	04/14/17 11:00	04/15/17 06:11	67-64-1	
Benzene	<b>&lt;4.9</b>	ug/kg	22.8	4.9	1	04/14/17 11:00	04/15/17 06:11	71-43-2	
Bromodichloromethane	<b>&lt;15.9</b>	ug/kg	56.9	15.9	1	04/14/17 11:00	04/15/17 06:11	75-27-4	
Bromoform	<b>&lt;49.1</b>	ug/kg	228	49.1	1	04/14/17 11:00	04/15/17 06:11	75-25-2	
Bromomethane	<b>&lt;57.7</b>	ug/kg	569	57.7	1	04/14/17 11:00	04/15/17 06:11	74-83-9	
Carbon tetrachloride	<b>&lt;17.9</b>	ug/kg	56.9	17.9	1	04/14/17 11:00	04/15/17 06:11	56-23-5	
Chlorobenzene	<b>&lt;9.9</b>	ug/kg	56.9	9.9	1	04/14/17 11:00	04/15/17 06:11	108-90-7	
Chloroethane	<b>&lt;90.0</b>	ug/kg	569	90.0	1	04/14/17 11:00	04/15/17 06:11	75-00-3	
Chloroform	<b>&lt;27.7</b>	ug/kg	56.9	27.7	1	04/14/17 11:00	04/15/17 06:11	67-66-3	
Chloromethane	<b>&lt;27.6</b>	ug/kg	228	27.6	1	04/14/17 11:00	04/15/17 06:11	74-87-3	
Dibromochloromethane	<b>&lt;48.9</b>	ug/kg	228	48.9	1	04/14/17 11:00	04/15/17 06:11	124-48-1	
Dichlorodifluoromethane	<b>&lt;17.4</b>	ug/kg	228	17.4	1	04/14/17 11:00	04/15/17 06:11	75-71-8	
Ethylbenzene	<b>&lt;18.1</b>	ug/kg	56.9	18.1	1	04/14/17 11:00	04/15/17 06:11	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;53.5</b>	ug/kg	285	53.5	1	04/14/17 11:00	04/15/17 06:11	87-68-3	
Methyl-tert-butyl ether	<b>&lt;10.7</b>	ug/kg	56.9	10.7	1	04/14/17 11:00	04/15/17 06:11	1634-04-4	
Methylene Chloride	<b>&lt;105</b>	ug/kg	228	105	1	04/14/17 11:00	04/15/17 06:11	75-09-2	
Naphthalene	<b>&lt;13.8</b>	ug/kg	228	13.8	1	04/14/17 11:00	04/15/17 06:11	91-20-3	
Styrene	<b>&lt;14.8</b>	ug/kg	56.9	14.8	1	04/14/17 11:00	04/15/17 06:11	100-42-5	
Tetrachloroethene	<b>&lt;21.8</b>	ug/kg	56.9	21.8	1	04/14/17 11:00	04/15/17 06:11	127-18-4	
Tetrahydrofuran	<b>&lt;282</b>	ug/kg	2280	282	1	04/14/17 11:00	04/15/17 06:11	109-99-9	
Toluene	<b>&lt;18.1</b>	ug/kg	56.9	18.1	1	04/14/17 11:00	04/15/17 06:11	108-88-3	
Trichloroethene	<b>&lt;16.3</b>	ug/kg	56.9	16.3	1	04/14/17 11:00	04/15/17 06:11	79-01-6	
Trichlorofluoromethane	<b>&lt;57.2</b>	ug/kg	228	57.2	1	04/14/17 11:00	04/15/17 06:11	75-69-4	
Vinyl acetate	<b>&lt;60.2</b>	ug/kg	569	60.2	1	04/14/17 11:00	04/15/17 06:11	108-05-4	
Vinyl chloride	<b>&lt;7.3</b>	ug/kg	22.8	7.3	1	04/14/17 11:00	04/15/17 06:11	75-01-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-05**      **Lab ID: 10384673001**      Collected: 04/07/17 09:10      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<21.2	ug/kg	56.9	21.2	1	04/14/17 11:00	04/15/17 06:11	156-59-2	
cis-1,3-Dichloropropene	<26.0	ug/kg	56.9	26.0	1	04/14/17 11:00	04/15/17 06:11	10061-01-5	
m&p-Xylene	<28.6	ug/kg	114	28.6	1	04/14/17 11:00	04/15/17 06:11	179601-23-1	
o-Xylene	<17.0	ug/kg	56.9	17.0	1	04/14/17 11:00	04/15/17 06:11	95-47-6	
trans-1,2-Dichloroethene	<27.4	ug/kg	56.9	27.4	1	04/14/17 11:00	04/15/17 06:11	156-60-5	
trans-1,3-Dichloropropene	<19.4	ug/kg	228	19.4	1	04/14/17 11:00	04/15/17 06:11	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-125		1	04/14/17 11:00	04/15/17 06:11	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 06:11	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 06:11	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-10**      **Lab ID: 10384673002**      Collected: 04/07/17 09:20      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>18.3</b>	%	0.10	0.10	1		04/18/17 13:16		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;26.0</b>	ug/kg	62.2	26.0	1	04/14/17 11:00	04/15/17 06:29	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;13.8</b>	ug/kg	62.2	13.8	1	04/14/17 11:00	04/15/17 06:29	79-34-5	
1,1,2-Trichloroethane	<b>&lt;13.4</b>	ug/kg	62.2	13.4	1	04/14/17 11:00	04/15/17 06:29	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;44.8</b>	ug/kg	249	44.8	1	04/14/17 11:00	04/15/17 06:29	76-13-1	
1,1-Dichloroethane	<b>&lt;24.1</b>	ug/kg	62.2	24.1	1	04/14/17 11:00	04/15/17 06:29	75-34-3	
1,1-Dichloroethene	<b>&lt;15.8</b>	ug/kg	62.2	15.8	1	04/14/17 11:00	04/15/17 06:29	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;19.2</b>	ug/kg	62.2	19.2	1	04/14/17 11:00	04/15/17 06:29	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;13.7</b>	ug/kg	62.2	13.7	1	04/14/17 11:00	04/15/17 06:29	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;23.4</b>	ug/kg	62.2	23.4	1	04/14/17 11:00	04/15/17 06:29	106-93-4	
1,2-Dichlorobenzene	<b>&lt;12.0</b>	ug/kg	62.2	12.0	1	04/14/17 11:00	04/15/17 06:29	95-50-1	
1,2-Dichloroethane	<b>&lt;19.7</b>	ug/kg	62.2	19.7	1	04/14/17 11:00	04/15/17 06:29	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;14.3</b>	ug/kg	62.2	14.3	1	04/14/17 11:00	04/15/17 06:29	108-67-8	
1,3-Dichlorobenzene	<b>&lt;18.3</b>	ug/kg	62.2	18.3	1	04/14/17 11:00	04/15/17 06:29	541-73-1	
1,4-Dichlorobenzene	<b>&lt;18.0</b>	ug/kg	62.2	18.0	1	04/14/17 11:00	04/15/17 06:29	106-46-7	
2-Butanone (MEK)	<b>&lt;82.1</b>	ug/kg	311	82.1	1	04/14/17 11:00	04/15/17 06:29	78-93-3	
2-Hexanone	<b>&lt;73.3</b>	ug/kg	311	73.3	1	04/14/17 11:00	04/15/17 06:29	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;41.2</b>	ug/kg	311	41.2	1	04/14/17 11:00	04/15/17 06:29	108-10-1	
Acetone	<b>&lt;408</b>	ug/kg	1240	408	1	04/14/17 11:00	04/15/17 06:29	67-64-1	
Benzene	<b>&lt;5.4</b>	ug/kg	24.9	5.4	1	04/14/17 11:00	04/15/17 06:29	71-43-2	
Bromodichloromethane	<b>&lt;17.4</b>	ug/kg	62.2	17.4	1	04/14/17 11:00	04/15/17 06:29	75-27-4	
Bromoform	<b>&lt;53.6</b>	ug/kg	249	53.6	1	04/14/17 11:00	04/15/17 06:29	75-25-2	
Bromomethane	<b>&lt;63.1</b>	ug/kg	622	63.1	1	04/14/17 11:00	04/15/17 06:29	74-83-9	
Carbon tetrachloride	<b>&lt;19.5</b>	ug/kg	62.2	19.5	1	04/14/17 11:00	04/15/17 06:29	56-23-5	
Chlorobenzene	<b>&lt;10.8</b>	ug/kg	62.2	10.8	1	04/14/17 11:00	04/15/17 06:29	108-90-7	
Chloroethane	<b>&lt;98.3</b>	ug/kg	622	98.3	1	04/14/17 11:00	04/15/17 06:29	75-00-3	
Chloroform	<b>&lt;30.2</b>	ug/kg	62.2	30.2	1	04/14/17 11:00	04/15/17 06:29	67-66-3	
Chloromethane	<b>&lt;30.1</b>	ug/kg	249	30.1	1	04/14/17 11:00	04/15/17 06:29	74-87-3	
Dibromochloromethane	<b>&lt;53.4</b>	ug/kg	249	53.4	1	04/14/17 11:00	04/15/17 06:29	124-48-1	
Dichlorodifluoromethane	<b>&lt;19.0</b>	ug/kg	249	19.0	1	04/14/17 11:00	04/15/17 06:29	75-71-8	
Ethylbenzene	<b>&lt;19.8</b>	ug/kg	62.2	19.8	1	04/14/17 11:00	04/15/17 06:29	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;58.5</b>	ug/kg	311	58.5	1	04/14/17 11:00	04/15/17 06:29	87-68-3	
Methyl-tert-butyl ether	<b>&lt;11.6</b>	ug/kg	62.2	11.6	1	04/14/17 11:00	04/15/17 06:29	1634-04-4	
Methylene Chloride	<b>&lt;115</b>	ug/kg	249	115	1	04/14/17 11:00	04/15/17 06:29	75-09-2	
Naphthalene	<b>&lt;15.1</b>	ug/kg	249	15.1	1	04/14/17 11:00	04/15/17 06:29	91-20-3	
Styrene	<b>&lt;16.2</b>	ug/kg	62.2	16.2	1	04/14/17 11:00	04/15/17 06:29	100-42-5	
Tetrachloroethene	<b>&lt;23.8</b>	ug/kg	62.2	23.8	1	04/14/17 11:00	04/15/17 06:29	127-18-4	
Tetrahydrofuran	<b>&lt;309</b>	ug/kg	2490	309	1	04/14/17 11:00	04/15/17 06:29	109-99-9	
Toluene	<b>&lt;19.8</b>	ug/kg	62.2	19.8	1	04/14/17 11:00	04/15/17 06:29	108-88-3	
Trichloroethene	<b>&lt;17.8</b>	ug/kg	62.2	17.8	1	04/14/17 11:00	04/15/17 06:29	79-01-6	
Trichlorofluoromethane	<b>&lt;62.5</b>	ug/kg	249	62.5	1	04/14/17 11:00	04/15/17 06:29	75-69-4	
Vinyl acetate	<b>&lt;65.8</b>	ug/kg	622	65.8	1	04/14/17 11:00	04/15/17 06:29	108-05-4	
Vinyl chloride	<b>&lt;8.0</b>	ug/kg	24.9	8.0	1	04/14/17 11:00	04/15/17 06:29	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-10**      **Lab ID: 10384673002**      Collected: 04/07/17 09:20      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<23.2	ug/kg	62.2	23.2	1	04/14/17 11:00	04/15/17 06:29	156-59-2	
cis-1,3-Dichloropropene	<28.4	ug/kg	62.2	28.4	1	04/14/17 11:00	04/15/17 06:29	10061-01-5	
m&p-Xylene	<31.2	ug/kg	124	31.2	1	04/14/17 11:00	04/15/17 06:29	179601-23-1	
o-Xylene	<18.5	ug/kg	62.2	18.5	1	04/14/17 11:00	04/15/17 06:29	95-47-6	
trans-1,2-Dichloroethene	<30.0	ug/kg	62.2	30.0	1	04/14/17 11:00	04/15/17 06:29	156-60-5	
trans-1,3-Dichloropropene	<21.2	ug/kg	249	21.2	1	04/14/17 11:00	04/15/17 06:29	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 06:29	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 06:29	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 06:29	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-15**      **Lab ID: 10384673003**      Collected: 04/07/17 09:30      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>26.9</b>	%	0.10	0.10	1		04/18/17 13:16		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;26.6</b>	ug/kg	63.7	26.6	1	04/14/17 11:00	04/15/17 06:47	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;14.1</b>	ug/kg	63.7	14.1	1	04/14/17 11:00	04/15/17 06:47	79-34-5	
1,1,2-Trichloroethane	<b>&lt;13.8</b>	ug/kg	63.7	13.8	1	04/14/17 11:00	04/15/17 06:47	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;45.9</b>	ug/kg	255	45.9	1	04/14/17 11:00	04/15/17 06:47	76-13-1	
1,1-Dichloroethane	<b>&lt;24.7</b>	ug/kg	63.7	24.7	1	04/14/17 11:00	04/15/17 06:47	75-34-3	
1,1-Dichloroethene	<b>&lt;16.2</b>	ug/kg	63.7	16.2	1	04/14/17 11:00	04/15/17 06:47	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;19.6</b>	ug/kg	63.7	19.6	1	04/14/17 11:00	04/15/17 06:47	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;14.0</b>	ug/kg	63.7	14.0	1	04/14/17 11:00	04/15/17 06:47	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;24.0</b>	ug/kg	63.7	24.0	1	04/14/17 11:00	04/15/17 06:47	106-93-4	
1,2-Dichlorobenzene	<b>&lt;12.3</b>	ug/kg	63.7	12.3	1	04/14/17 11:00	04/15/17 06:47	95-50-1	
1,2-Dichloroethane	<b>&lt;20.1</b>	ug/kg	63.7	20.1	1	04/14/17 11:00	04/15/17 06:47	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;14.7</b>	ug/kg	63.7	14.7	1	04/14/17 11:00	04/15/17 06:47	108-67-8	
1,3-Dichlorobenzene	<b>&lt;18.7</b>	ug/kg	63.7	18.7	1	04/14/17 11:00	04/15/17 06:47	541-73-1	
1,4-Dichlorobenzene	<b>&lt;18.5</b>	ug/kg	63.7	18.5	1	04/14/17 11:00	04/15/17 06:47	106-46-7	
2-Butanone (MEK)	<b>&lt;84.1</b>	ug/kg	319	84.1	1	04/14/17 11:00	04/15/17 06:47	78-93-3	
2-Hexanone	<b>&lt;75.1</b>	ug/kg	319	75.1	1	04/14/17 11:00	04/15/17 06:47	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;42.2</b>	ug/kg	319	42.2	1	04/14/17 11:00	04/15/17 06:47	108-10-1	
Acetone	<b>&lt;418</b>	ug/kg	1270	418	1	04/14/17 11:00	04/15/17 06:47	67-64-1	
Benzene	<b>&lt;5.5</b>	ug/kg	25.5	5.5	1	04/14/17 11:00	04/15/17 06:47	71-43-2	
Bromodichloromethane	<b>&lt;17.8</b>	ug/kg	63.7	17.8	1	04/14/17 11:00	04/15/17 06:47	75-27-4	
Bromoform	<b>&lt;54.9</b>	ug/kg	255	54.9	1	04/14/17 11:00	04/15/17 06:47	75-25-2	
Bromomethane	<b>&lt;64.6</b>	ug/kg	637	64.6	1	04/14/17 11:00	04/15/17 06:47	74-83-9	
Carbon tetrachloride	<b>&lt;20.0</b>	ug/kg	63.7	20.0	1	04/14/17 11:00	04/15/17 06:47	56-23-5	
Chlorobenzene	<b>&lt;11.1</b>	ug/kg	63.7	11.1	1	04/14/17 11:00	04/15/17 06:47	108-90-7	
Chloroethane	<b>&lt;101</b>	ug/kg	637	101	1	04/14/17 11:00	04/15/17 06:47	75-00-3	
Chloroform	<b>&lt;31.0</b>	ug/kg	63.7	31.0	1	04/14/17 11:00	04/15/17 06:47	67-66-3	
Chloromethane	<b>&lt;30.8</b>	ug/kg	255	30.8	1	04/14/17 11:00	04/15/17 06:47	74-87-3	
Dibromochloromethane	<b>&lt;54.7</b>	ug/kg	255	54.7	1	04/14/17 11:00	04/15/17 06:47	124-48-1	
Dichlorodifluoromethane	<b>&lt;19.5</b>	ug/kg	255	19.5	1	04/14/17 11:00	04/15/17 06:47	75-71-8	
Ethylbenzene	<b>&lt;20.3</b>	ug/kg	63.7	20.3	1	04/14/17 11:00	04/15/17 06:47	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;59.9</b>	ug/kg	319	59.9	1	04/14/17 11:00	04/15/17 06:47	87-68-3	
Methyl-tert-butyl ether	<b>&lt;11.9</b>	ug/kg	63.7	11.9	1	04/14/17 11:00	04/15/17 06:47	1634-04-4	
Methylene Chloride	<b>&lt;118</b>	ug/kg	255	118	1	04/14/17 11:00	04/15/17 06:47	75-09-2	
Naphthalene	<b>&lt;15.4</b>	ug/kg	255	15.4	1	04/14/17 11:00	04/15/17 06:47	91-20-3	
Styrene	<b>&lt;16.6</b>	ug/kg	63.7	16.6	1	04/14/17 11:00	04/15/17 06:47	100-42-5	
Tetrachloroethene	<b>&lt;24.3</b>	ug/kg	63.7	24.3	1	04/14/17 11:00	04/15/17 06:47	127-18-4	
Tetrahydrofuran	<b>&lt;316</b>	ug/kg	2550	316	1	04/14/17 11:00	04/15/17 06:47	109-99-9	
Toluene	<b>&lt;20.3</b>	ug/kg	63.7	20.3	1	04/14/17 11:00	04/15/17 06:47	108-88-3	
Trichloroethene	<b>&lt;18.2</b>	ug/kg	63.7	18.2	1	04/14/17 11:00	04/15/17 06:47	79-01-6	
Trichlorofluoromethane	<b>&lt;64.0</b>	ug/kg	255	64.0	1	04/14/17 11:00	04/15/17 06:47	75-69-4	
Vinyl acetate	<b>&lt;67.4</b>	ug/kg	637	67.4	1	04/14/17 11:00	04/15/17 06:47	108-05-4	
Vinyl chloride	<b>&lt;8.2</b>	ug/kg	25.5	8.2	1	04/14/17 11:00	04/15/17 06:47	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-15**      **Lab ID: 10384673003**      Collected: 04/07/17 09:30      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<23.7	ug/kg	63.7	23.7	1	04/14/17 11:00	04/15/17 06:47	156-59-2	
cis-1,3-Dichloropropene	<29.1	ug/kg	63.7	29.1	1	04/14/17 11:00	04/15/17 06:47	10061-01-5	
m&p-Xylene	<32.0	ug/kg	127	32.0	1	04/14/17 11:00	04/15/17 06:47	179601-23-1	
o-Xylene	<19.0	ug/kg	63.7	19.0	1	04/14/17 11:00	04/15/17 06:47	95-47-6	
trans-1,2-Dichloroethene	<30.7	ug/kg	63.7	30.7	1	04/14/17 11:00	04/15/17 06:47	156-60-5	
trans-1,3-Dichloropropene	<21.7	ug/kg	255	21.7	1	04/14/17 11:00	04/15/17 06:47	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 06:47	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 06:47	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1	04/14/17 11:00	04/15/17 06:47	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-20**      **Lab ID: 10384673004**      Collected: 04/07/17 09:40      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>									
Analytical Method: ASTM D2974									
Percent Moisture	<b>30.6</b>	%	0.10	0.10	1		04/18/17 13:16		
<b>8260B MSV 5030 Med Level</b>									
Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B									
1,1,1-Trichloroethane	<b>&lt;30.2</b>	ug/kg	72.4	30.2	1	04/14/17 11:00	04/15/17 07:05	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;16.1</b>	ug/kg	72.4	16.1	1	04/14/17 11:00	04/15/17 07:05	79-34-5	
1,1,2-Trichloroethane	<b>&lt;15.6</b>	ug/kg	72.4	15.6	1	04/14/17 11:00	04/15/17 07:05	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;52.1</b>	ug/kg	289	52.1	1	04/14/17 11:00	04/15/17 07:05	76-13-1	
1,1-Dichloroethane	<b>&lt;28.1</b>	ug/kg	72.4	28.1	1	04/14/17 11:00	04/15/17 07:05	75-34-3	
1,1-Dichloroethene	<b>&lt;18.4</b>	ug/kg	72.4	18.4	1	04/14/17 11:00	04/15/17 07:05	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;22.3</b>	ug/kg	72.4	22.3	1	04/14/17 11:00	04/15/17 07:05	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;15.9</b>	ug/kg	72.4	15.9	1	04/14/17 11:00	04/15/17 07:05	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;27.2</b>	ug/kg	72.4	27.2	1	04/14/17 11:00	04/15/17 07:05	106-93-4	
1,2-Dichlorobenzene	<b>&lt;14.0</b>	ug/kg	72.4	14.0	1	04/14/17 11:00	04/15/17 07:05	95-50-1	
1,2-Dichloroethane	<b>&lt;22.9</b>	ug/kg	72.4	22.9	1	04/14/17 11:00	04/15/17 07:05	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;16.6</b>	ug/kg	72.4	16.6	1	04/14/17 11:00	04/15/17 07:05	108-67-8	
1,3-Dichlorobenzene	<b>&lt;21.3</b>	ug/kg	72.4	21.3	1	04/14/17 11:00	04/15/17 07:05	541-73-1	
1,4-Dichlorobenzene	<b>&lt;21.0</b>	ug/kg	72.4	21.0	1	04/14/17 11:00	04/15/17 07:05	106-46-7	
2-Butanone (MEK)	<b>&lt;95.5</b>	ug/kg	362	95.5	1	04/14/17 11:00	04/15/17 07:05	78-93-3	
2-Hexanone	<b>&lt;85.2</b>	ug/kg	362	85.2	1	04/14/17 11:00	04/15/17 07:05	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;47.9</b>	ug/kg	362	47.9	1	04/14/17 11:00	04/15/17 07:05	108-10-1	
Acetone	<b>&lt;475</b>	ug/kg	1450	475	1	04/14/17 11:00	04/15/17 07:05	67-64-1	
Benzene	<b>&lt;6.3</b>	ug/kg	28.9	6.3	1	04/14/17 11:00	04/15/17 07:05	71-43-2	
Bromodichloromethane	<b>&lt;20.3</b>	ug/kg	72.4	20.3	1	04/14/17 11:00	04/15/17 07:05	75-27-4	
Bromoform	<b>&lt;62.4</b>	ug/kg	289	62.4	1	04/14/17 11:00	04/15/17 07:05	75-25-2	
Bromomethane	<b>&lt;73.4</b>	ug/kg	724	73.4	1	04/14/17 11:00	04/15/17 07:05	74-83-9	
Carbon tetrachloride	<b>&lt;22.7</b>	ug/kg	72.4	22.7	1	04/14/17 11:00	04/15/17 07:05	56-23-5	
Chlorobenzene	<b>&lt;12.6</b>	ug/kg	72.4	12.6	1	04/14/17 11:00	04/15/17 07:05	108-90-7	
Chloroethane	<b>&lt;114</b>	ug/kg	724	114	1	04/14/17 11:00	04/15/17 07:05	75-00-3	
Chloroform	<b>&lt;35.2</b>	ug/kg	72.4	35.2	1	04/14/17 11:00	04/15/17 07:05	67-66-3	
Chloromethane	<b>&lt;35.0</b>	ug/kg	289	35.0	1	04/14/17 11:00	04/15/17 07:05	74-87-3	
Dibromochloromethane	<b>&lt;62.1</b>	ug/kg	289	62.1	1	04/14/17 11:00	04/15/17 07:05	124-48-1	
Dichlorodifluoromethane	<b>&lt;22.1</b>	ug/kg	289	22.1	1	04/14/17 11:00	04/15/17 07:05	75-71-8	
Ethylbenzene	<b>&lt;23.0</b>	ug/kg	72.4	23.0	1	04/14/17 11:00	04/15/17 07:05	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;68.0</b>	ug/kg	362	68.0	1	04/14/17 11:00	04/15/17 07:05	87-68-3	
Methyl-tert-butyl ether	<b>&lt;13.5</b>	ug/kg	72.4	13.5	1	04/14/17 11:00	04/15/17 07:05	1634-04-4	
Methylene Chloride	<b>&lt;134</b>	ug/kg	289	134	1	04/14/17 11:00	04/15/17 07:05	75-09-2	
Naphthalene	<b>&lt;17.5</b>	ug/kg	289	17.5	1	04/14/17 11:00	04/15/17 07:05	91-20-3	
Styrene	<b>&lt;18.8</b>	ug/kg	72.4	18.8	1	04/14/17 11:00	04/15/17 07:05	100-42-5	
Tetrachloroethene	<b>&lt;27.6</b>	ug/kg	72.4	27.6	1	04/14/17 11:00	04/15/17 07:05	127-18-4	
Tetrahydrofuran	<b>&lt;359</b>	ug/kg	2890	359	1	04/14/17 11:00	04/15/17 07:05	109-99-9	
Toluene	<b>&lt;23.0</b>	ug/kg	72.4	23.0	1	04/14/17 11:00	04/15/17 07:05	108-88-3	
Trichloroethene	<b>&lt;20.7</b>	ug/kg	72.4	20.7	1	04/14/17 11:00	04/15/17 07:05	79-01-6	
Trichlorofluoromethane	<b>&lt;72.7</b>	ug/kg	289	72.7	1	04/14/17 11:00	04/15/17 07:05	75-69-4	
Vinyl acetate	<b>&lt;76.6</b>	ug/kg	724	76.6	1	04/14/17 11:00	04/15/17 07:05	108-05-4	
Vinyl chloride	<b>&lt;9.3</b>	ug/kg	28.9	9.3	1	04/14/17 11:00	04/15/17 07:05	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-20**      **Lab ID: 10384673004**      Collected: 04/07/17 09:40      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<26.9	ug/kg	72.4	26.9	1	04/14/17 11:00	04/15/17 07:05	156-59-2	
cis-1,3-Dichloropropene	<33.0	ug/kg	72.4	33.0	1	04/14/17 11:00	04/15/17 07:05	10061-01-5	
m&p-Xylene	<36.3	ug/kg	145	36.3	1	04/14/17 11:00	04/15/17 07:05	179601-23-1	
o-Xylene	<21.6	ug/kg	72.4	21.6	1	04/14/17 11:00	04/15/17 07:05	95-47-6	
trans-1,2-Dichloroethene	<34.9	ug/kg	72.4	34.9	1	04/14/17 11:00	04/15/17 07:05	156-60-5	
trans-1,3-Dichloropropene	<24.6	ug/kg	289	24.6	1	04/14/17 11:00	04/15/17 07:05	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 07:05	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 07:05	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 07:05	460-00-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-25**      **Lab ID: 10384673005**      Collected: 04/07/17 09:45      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>19.1</b>	%	0.10	0.10	1		04/18/17 13:16		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;25.2</b>	ug/kg	60.3	25.2	1	04/14/17 11:00	04/15/17 07:23	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;13.4</b>	ug/kg	60.3	13.4	1	04/14/17 11:00	04/15/17 07:23	79-34-5	
1,1,2-Trichloroethane	<b>&lt;13.0</b>	ug/kg	60.3	13.0	1	04/14/17 11:00	04/15/17 07:23	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;43.4</b>	ug/kg	241	43.4	1	04/14/17 11:00	04/15/17 07:23	76-13-1	
1,1-Dichloroethane	<b>&lt;23.4</b>	ug/kg	60.3	23.4	1	04/14/17 11:00	04/15/17 07:23	75-34-3	
1,1-Dichloroethene	<b>&lt;15.3</b>	ug/kg	60.3	15.3	1	04/14/17 11:00	04/15/17 07:23	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;18.6</b>	ug/kg	60.3	18.6	1	04/14/17 11:00	04/15/17 07:23	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;13.3</b>	ug/kg	60.3	13.3	1	04/14/17 11:00	04/15/17 07:23	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;22.7</b>	ug/kg	60.3	22.7	1	04/14/17 11:00	04/15/17 07:23	106-93-4	
1,2-Dichlorobenzene	<b>&lt;11.6</b>	ug/kg	60.3	11.6	1	04/14/17 11:00	04/15/17 07:23	95-50-1	
1,2-Dichloroethane	<b>&lt;19.0</b>	ug/kg	60.3	19.0	1	04/14/17 11:00	04/15/17 07:23	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;13.9</b>	ug/kg	60.3	13.9	1	04/14/17 11:00	04/15/17 07:23	108-67-8	
1,3-Dichlorobenzene	<b>&lt;17.7</b>	ug/kg	60.3	17.7	1	04/14/17 11:00	04/15/17 07:23	541-73-1	
1,4-Dichlorobenzene	<b>&lt;17.5</b>	ug/kg	60.3	17.5	1	04/14/17 11:00	04/15/17 07:23	106-46-7	
2-Butanone (MEK)	<b>&lt;79.5</b>	ug/kg	301	79.5	1	04/14/17 11:00	04/15/17 07:23	78-93-3	
2-Hexanone	<b>&lt;71.0</b>	ug/kg	301	71.0	1	04/14/17 11:00	04/15/17 07:23	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;39.9</b>	ug/kg	301	39.9	1	04/14/17 11:00	04/15/17 07:23	108-10-1	
Acetone	<b>&lt;395</b>	ug/kg	1210	395	1	04/14/17 11:00	04/15/17 07:23	67-64-1	
Benzene	<b>&lt;5.2</b>	ug/kg	24.1	5.2	1	04/14/17 11:00	04/15/17 07:23	71-43-2	
Bromodichloromethane	<b>&lt;16.9</b>	ug/kg	60.3	16.9	1	04/14/17 11:00	04/15/17 07:23	75-27-4	
Bromoform	<b>&lt;51.9</b>	ug/kg	241	51.9	1	04/14/17 11:00	04/15/17 07:23	75-25-2	
Bromomethane	<b>&lt;61.1</b>	ug/kg	603	61.1	1	04/14/17 11:00	04/15/17 07:23	74-83-9	
Carbon tetrachloride	<b>&lt;18.9</b>	ug/kg	60.3	18.9	1	04/14/17 11:00	04/15/17 07:23	56-23-5	
Chlorobenzene	<b>&lt;10.5</b>	ug/kg	60.3	10.5	1	04/14/17 11:00	04/15/17 07:23	108-90-7	
Chloroethane	<b>&lt;95.2</b>	ug/kg	603	95.2	1	04/14/17 11:00	04/15/17 07:23	75-00-3	
Chloroform	<b>&lt;29.3</b>	ug/kg	60.3	29.3	1	04/14/17 11:00	04/15/17 07:23	67-66-3	
Chloromethane	<b>&lt;29.2</b>	ug/kg	241	29.2	1	04/14/17 11:00	04/15/17 07:23	74-87-3	
Dibromochloromethane	<b>&lt;51.7</b>	ug/kg	241	51.7	1	04/14/17 11:00	04/15/17 07:23	124-48-1	
Dichlorodifluoromethane	<b>&lt;18.4</b>	ug/kg	241	18.4	1	04/14/17 11:00	04/15/17 07:23	75-71-8	
Ethylbenzene	<b>&lt;19.2</b>	ug/kg	60.3	19.2	1	04/14/17 11:00	04/15/17 07:23	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;56.6</b>	ug/kg	301	56.6	1	04/14/17 11:00	04/15/17 07:23	87-68-3	
Methyl-tert-butyl ether	<b>&lt;11.3</b>	ug/kg	60.3	11.3	1	04/14/17 11:00	04/15/17 07:23	1634-04-4	
Methylene Chloride	<b>&lt;112</b>	ug/kg	241	112	1	04/14/17 11:00	04/15/17 07:23	75-09-2	
Naphthalene	<b>&lt;14.6</b>	ug/kg	241	14.6	1	04/14/17 11:00	04/15/17 07:23	91-20-3	
Styrene	<b>&lt;15.7</b>	ug/kg	60.3	15.7	1	04/14/17 11:00	04/15/17 07:23	100-42-5	
Tetrachloroethene	<b>&lt;23.0</b>	ug/kg	60.3	23.0	1	04/14/17 11:00	04/15/17 07:23	127-18-4	
Tetrahydrofuran	<b>&lt;299</b>	ug/kg	2410	299	1	04/14/17 11:00	04/15/17 07:23	109-99-9	
Toluene	<b>&lt;19.2</b>	ug/kg	60.3	19.2	1	04/14/17 11:00	04/15/17 07:23	108-88-3	
Trichloroethene	<b>&lt;17.2</b>	ug/kg	60.3	17.2	1	04/14/17 11:00	04/15/17 07:23	79-01-6	
Trichlorofluoromethane	<b>&lt;60.5</b>	ug/kg	241	60.5	1	04/14/17 11:00	04/15/17 07:23	75-69-4	
Vinyl acetate	<b>&lt;63.8</b>	ug/kg	603	63.8	1	04/14/17 11:00	04/15/17 07:23	108-05-4	
Vinyl chloride	<b>&lt;7.7</b>	ug/kg	24.1	7.7	1	04/14/17 11:00	04/15/17 07:23	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-25**      **Lab ID: 10384673005**      Collected: 04/07/17 09:45      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<22.4	ug/kg	60.3	22.4	1	04/14/17 11:00	04/15/17 07:23	156-59-2	
cis-1,3-Dichloropropene	<27.5	ug/kg	60.3	27.5	1	04/14/17 11:00	04/15/17 07:23	10061-01-5	
m&p-Xylene	<30.2	ug/kg	121	30.2	1	04/14/17 11:00	04/15/17 07:23	179601-23-1	
o-Xylene	<18.0	ug/kg	60.3	18.0	1	04/14/17 11:00	04/15/17 07:23	95-47-6	
trans-1,2-Dichloroethene	<29.0	ug/kg	60.3	29.0	1	04/14/17 11:00	04/15/17 07:23	156-60-5	
trans-1,3-Dichloropropene	<20.5	ug/kg	241	20.5	1	04/14/17 11:00	04/15/17 07:23	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-125		1	04/14/17 11:00	04/15/17 07:23	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 07:23	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 07:23	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-30**      **Lab ID: 10384673006**      Collected: 04/07/17 10:05      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>30.1</b>	%	0.10	0.10	1		04/18/17 13:17		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	< <b>28.1</b>	ug/kg	67.3	28.1	1	04/14/17 11:00	04/15/17 07:41	71-55-6	
1,1,2,2-Tetrachloroethane	< <b>14.9</b>	ug/kg	67.3	14.9	1	04/14/17 11:00	04/15/17 07:41	79-34-5	
1,1,2-Trichloroethane	< <b>14.5</b>	ug/kg	67.3	14.5	1	04/14/17 11:00	04/15/17 07:41	79-00-5	
1,1,2-Trichlorotrifluoroethane	< <b>48.4</b>	ug/kg	269	48.4	1	04/14/17 11:00	04/15/17 07:41	76-13-1	
1,1-Dichloroethane	< <b>26.1</b>	ug/kg	67.3	26.1	1	04/14/17 11:00	04/15/17 07:41	75-34-3	
1,1-Dichloroethene	< <b>17.1</b>	ug/kg	67.3	17.1	1	04/14/17 11:00	04/15/17 07:41	75-35-4	
1,2,4-Trichlorobenzene	< <b>20.7</b>	ug/kg	67.3	20.7	1	04/14/17 11:00	04/15/17 07:41	120-82-1	
1,2,4-Trimethylbenzene	< <b>14.8</b>	ug/kg	67.3	14.8	1	04/14/17 11:00	04/15/17 07:41	95-63-6	
1,2-Dibromoethane (EDB)	< <b>25.3</b>	ug/kg	67.3	25.3	1	04/14/17 11:00	04/15/17 07:41	106-93-4	
1,2-Dichlorobenzene	< <b>13.0</b>	ug/kg	67.3	13.0	1	04/14/17 11:00	04/15/17 07:41	95-50-1	
1,2-Dichloroethane	< <b>21.3</b>	ug/kg	67.3	21.3	1	04/14/17 11:00	04/15/17 07:41	107-06-2	
1,3,5-Trimethylbenzene	< <b>15.5</b>	ug/kg	67.3	15.5	1	04/14/17 11:00	04/15/17 07:41	108-67-8	
1,3-Dichlorobenzene	< <b>19.8</b>	ug/kg	67.3	19.8	1	04/14/17 11:00	04/15/17 07:41	541-73-1	
1,4-Dichlorobenzene	< <b>19.5</b>	ug/kg	67.3	19.5	1	04/14/17 11:00	04/15/17 07:41	106-46-7	
2-Butanone (MEK)	< <b>88.8</b>	ug/kg	336	88.8	1	04/14/17 11:00	04/15/17 07:41	78-93-3	
2-Hexanone	< <b>79.3</b>	ug/kg	336	79.3	1	04/14/17 11:00	04/15/17 07:41	591-78-6	
4-Methyl-2-pentanone (MIBK)	< <b>44.5</b>	ug/kg	336	44.5	1	04/14/17 11:00	04/15/17 07:41	108-10-1	
Acetone	< <b>441</b>	ug/kg	1350	441	1	04/14/17 11:00	04/15/17 07:41	67-64-1	
Benzene	< <b>5.8</b>	ug/kg	26.9	5.8	1	04/14/17 11:00	04/15/17 07:41	71-43-2	
Bromodichloromethane	< <b>18.8</b>	ug/kg	67.3	18.8	1	04/14/17 11:00	04/15/17 07:41	75-27-4	
Bromoform	< <b>58.0</b>	ug/kg	269	58.0	1	04/14/17 11:00	04/15/17 07:41	75-25-2	
Bromomethane	< <b>68.2</b>	ug/kg	673	68.2	1	04/14/17 11:00	04/15/17 07:41	74-83-9	
Carbon tetrachloride	< <b>21.1</b>	ug/kg	67.3	21.1	1	04/14/17 11:00	04/15/17 07:41	56-23-5	
Chlorobenzene	< <b>11.7</b>	ug/kg	67.3	11.7	1	04/14/17 11:00	04/15/17 07:41	108-90-7	
Chloroethane	< <b>106</b>	ug/kg	673	106	1	04/14/17 11:00	04/15/17 07:41	75-00-3	
Chloroform	< <b>32.7</b>	ug/kg	67.3	32.7	1	04/14/17 11:00	04/15/17 07:41	67-66-3	
Chloromethane	< <b>32.6</b>	ug/kg	269	32.6	1	04/14/17 11:00	04/15/17 07:41	74-87-3	
Dibromochloromethane	< <b>57.7</b>	ug/kg	269	57.7	1	04/14/17 11:00	04/15/17 07:41	124-48-1	
Dichlorodifluoromethane	< <b>20.6</b>	ug/kg	269	20.6	1	04/14/17 11:00	04/15/17 07:41	75-71-8	
Ethylbenzene	< <b>21.4</b>	ug/kg	67.3	21.4	1	04/14/17 11:00	04/15/17 07:41	100-41-4	
Hexachloro-1,3-butadiene	< <b>63.2</b>	ug/kg	336	63.2	1	04/14/17 11:00	04/15/17 07:41	87-68-3	
Methyl-tert-butyl ether	< <b>12.6</b>	ug/kg	67.3	12.6	1	04/14/17 11:00	04/15/17 07:41	1634-04-4	
Methylene Chloride	< <b>125</b>	ug/kg	269	125	1	04/14/17 11:00	04/15/17 07:41	75-09-2	
Naphthalene	< <b>16.3</b>	ug/kg	269	16.3	1	04/14/17 11:00	04/15/17 07:41	91-20-3	
Styrene	< <b>17.5</b>	ug/kg	67.3	17.5	1	04/14/17 11:00	04/15/17 07:41	100-42-5	
Tetrachloroethene	< <b>25.7</b>	ug/kg	67.3	25.7	1	04/14/17 11:00	04/15/17 07:41	127-18-4	
Tetrahydrofuran	< <b>334</b>	ug/kg	2690	334	1	04/14/17 11:00	04/15/17 07:41	109-99-9	
Toluene	< <b>21.4</b>	ug/kg	67.3	21.4	1	04/14/17 11:00	04/15/17 07:41	108-88-3	
Trichloroethene	< <b>19.2</b>	ug/kg	67.3	19.2	1	04/14/17 11:00	04/15/17 07:41	79-01-6	
Trichlorofluoromethane	< <b>67.6</b>	ug/kg	269	67.6	1	04/14/17 11:00	04/15/17 07:41	75-69-4	
Vinyl acetate	< <b>71.2</b>	ug/kg	673	71.2	1	04/14/17 11:00	04/15/17 07:41	108-05-4	
Vinyl chloride	< <b>8.6</b>	ug/kg	26.9	8.6	1	04/14/17 11:00	04/15/17 07:41	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-30**      **Lab ID: 10384673006**      Collected: 04/07/17 10:05      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<25.0	ug/kg	67.3	25.0	1	04/14/17 11:00	04/15/17 07:41	156-59-2	
cis-1,3-Dichloropropene	<30.7	ug/kg	67.3	30.7	1	04/14/17 11:00	04/15/17 07:41	10061-01-5	
m&p-Xylene	<33.8	ug/kg	135	33.8	1	04/14/17 11:00	04/15/17 07:41	179601-23-1	
o-Xylene	<20.1	ug/kg	67.3	20.1	1	04/14/17 11:00	04/15/17 07:41	95-47-6	
trans-1,2-Dichloroethene	<32.4	ug/kg	67.3	32.4	1	04/14/17 11:00	04/15/17 07:41	156-60-5	
trans-1,3-Dichloropropene	<22.9	ug/kg	269	22.9	1	04/14/17 11:00	04/15/17 07:41	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 07:41	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 07:41	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 07:41	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-35**      **Lab ID: 10384673007**      Collected: 04/07/17 10:10      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>									
Analytical Method: ASTM D2974									
Percent Moisture	<b>29.6</b>	%	0.10	0.10	1		04/18/17 13:17		
<b>8260B MSV 5030 Med Level</b>									
Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B									
1,1,1-Trichloroethane	<b>&lt;27.3</b>	ug/kg	65.4	27.3	1	04/14/17 11:00	04/15/17 07:59	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;14.5</b>	ug/kg	65.4	14.5	1	04/14/17 11:00	04/15/17 07:59	79-34-5	
1,1,2-Trichloroethane	<b>&lt;14.1</b>	ug/kg	65.4	14.1	1	04/14/17 11:00	04/15/17 07:59	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;47.1</b>	ug/kg	262	47.1	1	04/14/17 11:00	04/15/17 07:59	76-13-1	
1,1-Dichloroethane	<b>&lt;25.4</b>	ug/kg	65.4	25.4	1	04/14/17 11:00	04/15/17 07:59	75-34-3	
1,1-Dichloroethene	<b>&lt;16.6</b>	ug/kg	65.4	16.6	1	04/14/17 11:00	04/15/17 07:59	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;20.1</b>	ug/kg	65.4	20.1	1	04/14/17 11:00	04/15/17 07:59	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;14.4</b>	ug/kg	65.4	14.4	1	04/14/17 11:00	04/15/17 07:59	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;24.6</b>	ug/kg	65.4	24.6	1	04/14/17 11:00	04/15/17 07:59	106-93-4	
1,2-Dichlorobenzene	<b>&lt;12.6</b>	ug/kg	65.4	12.6	1	04/14/17 11:00	04/15/17 07:59	95-50-1	
1,2-Dichloroethane	<b>&lt;20.7</b>	ug/kg	65.4	20.7	1	04/14/17 11:00	04/15/17 07:59	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;15.0</b>	ug/kg	65.4	15.0	1	04/14/17 11:00	04/15/17 07:59	108-67-8	
1,3-Dichlorobenzene	<b>&lt;19.2</b>	ug/kg	65.4	19.2	1	04/14/17 11:00	04/15/17 07:59	541-73-1	
1,4-Dichlorobenzene	<b>&lt;19.0</b>	ug/kg	65.4	19.0	1	04/14/17 11:00	04/15/17 07:59	106-46-7	
2-Butanone (MEK)	<b>&lt;86.3</b>	ug/kg	327	86.3	1	04/14/17 11:00	04/15/17 07:59	78-93-3	
2-Hexanone	<b>&lt;77.0</b>	ug/kg	327	77.0	1	04/14/17 11:00	04/15/17 07:59	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;43.3</b>	ug/kg	327	43.3	1	04/14/17 11:00	04/15/17 07:59	108-10-1	
Acetone	<b>&lt;429</b>	ug/kg	1310	429	1	04/14/17 11:00	04/15/17 07:59	67-64-1	
Benzene	<b>&lt;5.7</b>	ug/kg	26.2	5.7	1	04/14/17 11:00	04/15/17 07:59	71-43-2	
Bromodichloromethane	<b>&lt;18.3</b>	ug/kg	65.4	18.3	1	04/14/17 11:00	04/15/17 07:59	75-27-4	
Bromoform	<b>&lt;56.4</b>	ug/kg	262	56.4	1	04/14/17 11:00	04/15/17 07:59	75-25-2	
Bromomethane	<b>&lt;66.3</b>	ug/kg	65.4	66.3	1	04/14/17 11:00	04/15/17 07:59	74-83-9	
Carbon tetrachloride	<b>&lt;20.5</b>	ug/kg	65.4	20.5	1	04/14/17 11:00	04/15/17 07:59	56-23-5	
Chlorobenzene	<b>&lt;11.4</b>	ug/kg	65.4	11.4	1	04/14/17 11:00	04/15/17 07:59	108-90-7	
Chloroethane	<b>&lt;103</b>	ug/kg	65.4	103	1	04/14/17 11:00	04/15/17 07:59	75-00-3	
Chloroform	<b>&lt;31.8</b>	ug/kg	65.4	31.8	1	04/14/17 11:00	04/15/17 07:59	67-66-3	
Chloromethane	<b>&lt;31.7</b>	ug/kg	262	31.7	1	04/14/17 11:00	04/15/17 07:59	74-87-3	
Dibromochloromethane	<b>&lt;56.1</b>	ug/kg	262	56.1	1	04/14/17 11:00	04/15/17 07:59	124-48-1	
Dichlorodifluoromethane	<b>&lt;20.0</b>	ug/kg	262	20.0	1	04/14/17 11:00	04/15/17 07:59	75-71-8	
Ethylbenzene	<b>&lt;20.8</b>	ug/kg	65.4	20.8	1	04/14/17 11:00	04/15/17 07:59	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;61.5</b>	ug/kg	327	61.5	1	04/14/17 11:00	04/15/17 07:59	87-68-3	
Methyl-tert-butyl ether	<b>&lt;12.2</b>	ug/kg	65.4	12.2	1	04/14/17 11:00	04/15/17 07:59	1634-04-4	
Methylene Chloride	<b>&lt;121</b>	ug/kg	262	121	1	04/14/17 11:00	04/15/17 07:59	75-09-2	
Naphthalene	<b>&lt;15.8</b>	ug/kg	262	15.8	1	04/14/17 11:00	04/15/17 07:59	91-20-3	
Styrene	<b>&lt;17.0</b>	ug/kg	65.4	17.0	1	04/14/17 11:00	04/15/17 07:59	100-42-5	
Tetrachloroethene	<b>&lt;25.0</b>	ug/kg	65.4	25.0	1	04/14/17 11:00	04/15/17 07:59	127-18-4	
Tetrahydrofuran	<b>&lt;324</b>	ug/kg	2620	324	1	04/14/17 11:00	04/15/17 07:59	109-99-9	
Toluene	<b>&lt;20.8</b>	ug/kg	65.4	20.8	1	04/14/17 11:00	04/15/17 07:59	108-88-3	
Trichloroethene	<b>&lt;18.7</b>	ug/kg	65.4	18.7	1	04/14/17 11:00	04/15/17 07:59	79-01-6	
Trichlorofluoromethane	<b>&lt;65.7</b>	ug/kg	262	65.7	1	04/14/17 11:00	04/15/17 07:59	75-69-4	
Vinyl acetate	<b>&lt;69.2</b>	ug/kg	65.4	69.2	1	04/14/17 11:00	04/15/17 07:59	108-05-4	
Vinyl chloride	<b>&lt;8.4</b>	ug/kg	26.2	8.4	1	04/14/17 11:00	04/15/17 07:59	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-35**      **Lab ID: 10384673007**      Collected: 04/07/17 10:10      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<24.3	ug/kg	65.4	24.3	1	04/14/17 11:00	04/15/17 07:59	156-59-2	
cis-1,3-Dichloropropene	<29.8	ug/kg	65.4	29.8	1	04/14/17 11:00	04/15/17 07:59	10061-01-5	
m&p-Xylene	<32.8	ug/kg	131	32.8	1	04/14/17 11:00	04/15/17 07:59	179601-23-1	
o-Xylene	<19.5	ug/kg	65.4	19.5	1	04/14/17 11:00	04/15/17 07:59	95-47-6	
trans-1,2-Dichloroethene	<31.5	ug/kg	65.4	31.5	1	04/14/17 11:00	04/15/17 07:59	156-60-5	
trans-1,3-Dichloropropene	<22.2	ug/kg	262	22.2	1	04/14/17 11:00	04/15/17 07:59	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-125		1	04/14/17 11:00	04/15/17 07:59	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1	04/14/17 11:00	04/15/17 07:59	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 07:59	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-40**      **Lab ID: 10384673008**      Collected: 04/07/17 10:25      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>25.6</b>	%	0.10	0.10	1		04/18/17 13:17		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;26.2</b>	ug/kg	62.6	26.2	1	04/14/17 11:00	04/15/17 08:16	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;13.9</b>	ug/kg	62.6	13.9	1	04/14/17 11:00	04/15/17 08:16	79-34-5	
1,1,2-Trichloroethane	<b>&lt;13.5</b>	ug/kg	62.6	13.5	1	04/14/17 11:00	04/15/17 08:16	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;45.1</b>	ug/kg	250	45.1	1	04/14/17 11:00	04/15/17 08:16	76-13-1	
1,1-Dichloroethane	<b>&lt;24.3</b>	ug/kg	62.6	24.3	1	04/14/17 11:00	04/15/17 08:16	75-34-3	
1,1-Dichloroethene	<b>&lt;15.9</b>	ug/kg	62.6	15.9	1	04/14/17 11:00	04/15/17 08:16	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;19.3</b>	ug/kg	62.6	19.3	1	04/14/17 11:00	04/15/17 08:16	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;13.8</b>	ug/kg	62.6	13.8	1	04/14/17 11:00	04/15/17 08:16	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;23.5</b>	ug/kg	62.6	23.5	1	04/14/17 11:00	04/15/17 08:16	106-93-4	
1,2-Dichlorobenzene	<b>&lt;12.1</b>	ug/kg	62.6	12.1	1	04/14/17 11:00	04/15/17 08:16	95-50-1	
1,2-Dichloroethane	<b>&lt;19.8</b>	ug/kg	62.6	19.8	1	04/14/17 11:00	04/15/17 08:16	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;14.4</b>	ug/kg	62.6	14.4	1	04/14/17 11:00	04/15/17 08:16	108-67-8	
1,3-Dichlorobenzene	<b>&lt;18.4</b>	ug/kg	62.6	18.4	1	04/14/17 11:00	04/15/17 08:16	541-73-1	
1,4-Dichlorobenzene	<b>&lt;18.2</b>	ug/kg	62.6	18.2	1	04/14/17 11:00	04/15/17 08:16	106-46-7	
2-Butanone (MEK)	<b>&lt;82.7</b>	ug/kg	313	82.7	1	04/14/17 11:00	04/15/17 08:16	78-93-3	
2-Hexanone	<b>&lt;73.8</b>	ug/kg	313	73.8	1	04/14/17 11:00	04/15/17 08:16	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;41.5</b>	ug/kg	313	41.5	1	04/14/17 11:00	04/15/17 08:16	108-10-1	
Acetone	<b>&lt;411</b>	ug/kg	1250	411	1	04/14/17 11:00	04/15/17 08:16	67-64-1	
Benzene	<b>&lt;5.4</b>	ug/kg	25.0	5.4	1	04/14/17 11:00	04/15/17 08:16	71-43-2	
Bromodichloromethane	<b>&lt;17.5</b>	ug/kg	62.6	17.5	1	04/14/17 11:00	04/15/17 08:16	75-27-4	
Bromoform	<b>&lt;54.0</b>	ug/kg	250	54.0	1	04/14/17 11:00	04/15/17 08:16	75-25-2	
Bromomethane	<b>&lt;63.5</b>	ug/kg	626	63.5	1	04/14/17 11:00	04/15/17 08:16	74-83-9	
Carbon tetrachloride	<b>&lt;19.7</b>	ug/kg	62.6	19.7	1	04/14/17 11:00	04/15/17 08:16	56-23-5	
Chlorobenzene	<b>&lt;10.9</b>	ug/kg	62.6	10.9	1	04/14/17 11:00	04/15/17 08:16	108-90-7	
Chloroethane	<b>&lt;98.9</b>	ug/kg	626	98.9	1	04/14/17 11:00	04/15/17 08:16	75-00-3	
Chloroform	<b>&lt;30.4</b>	ug/kg	62.6	30.4	1	04/14/17 11:00	04/15/17 08:16	67-66-3	
Chloromethane	<b>&lt;30.3</b>	ug/kg	250	30.3	1	04/14/17 11:00	04/15/17 08:16	74-87-3	
Dibromochloromethane	<b>&lt;53.7</b>	ug/kg	250	53.7	1	04/14/17 11:00	04/15/17 08:16	124-48-1	
Dichlorodifluoromethane	<b>&lt;19.2</b>	ug/kg	250	19.2	1	04/14/17 11:00	04/15/17 08:16	75-71-8	
Ethylbenzene	<b>&lt;19.9</b>	ug/kg	62.6	19.9	1	04/14/17 11:00	04/15/17 08:16	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;58.9</b>	ug/kg	313	58.9	1	04/14/17 11:00	04/15/17 08:16	87-68-3	
Methyl-tert-butyl ether	<b>&lt;11.7</b>	ug/kg	62.6	11.7	1	04/14/17 11:00	04/15/17 08:16	1634-04-4	
Methylene Chloride	<b>&lt;116</b>	ug/kg	250	116	1	04/14/17 11:00	04/15/17 08:16	75-09-2	
Naphthalene	<b>&lt;15.2</b>	ug/kg	250	15.2	1	04/14/17 11:00	04/15/17 08:16	91-20-3	
Styrene	<b>&lt;16.3</b>	ug/kg	62.6	16.3	1	04/14/17 11:00	04/15/17 08:16	100-42-5	
Tetrachloroethene	<b>&lt;23.9</b>	ug/kg	62.6	23.9	1	04/14/17 11:00	04/15/17 08:16	127-18-4	
Tetrahydrofuran	<b>&lt;311</b>	ug/kg	2500	311	1	04/14/17 11:00	04/15/17 08:16	109-99-9	
Toluene	<b>&lt;19.9</b>	ug/kg	62.6	19.9	1	04/14/17 11:00	04/15/17 08:16	108-88-3	
Trichloroethene	<b>&lt;17.9</b>	ug/kg	62.6	17.9	1	04/14/17 11:00	04/15/17 08:16	79-01-6	
Trichlorofluoromethane	<b>&lt;62.9</b>	ug/kg	250	62.9	1	04/14/17 11:00	04/15/17 08:16	75-69-4	
Vinyl acetate	<b>&lt;66.2</b>	ug/kg	626	66.2	1	04/14/17 11:00	04/15/17 08:16	108-05-4	
Vinyl chloride	<b>&lt;8.0</b>	ug/kg	25.0	8.0	1	04/14/17 11:00	04/15/17 08:16	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-40**      **Lab ID: 10384673008**      Collected: 04/07/17 10:25      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<23.3	ug/kg	62.6	23.3	1	04/14/17 11:00	04/15/17 08:16	156-59-2	
cis-1,3-Dichloropropene	<28.6	ug/kg	62.6	28.6	1	04/14/17 11:00	04/15/17 08:16	10061-01-5	
m&p-Xylene	<31.4	ug/kg	125	31.4	1	04/14/17 11:00	04/15/17 08:16	179601-23-1	
o-Xylene	<18.7	ug/kg	62.6	18.7	1	04/14/17 11:00	04/15/17 08:16	95-47-6	
trans-1,2-Dichloroethene	<30.2	ug/kg	62.6	30.2	1	04/14/17 11:00	04/15/17 08:16	156-60-5	
trans-1,3-Dichloropropene	<21.3	ug/kg	250	21.3	1	04/14/17 11:00	04/15/17 08:16	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 08:16	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 08:16	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1	04/14/17 11:00	04/15/17 08:16	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

Sample: **SB44-SS-45** Lab ID: **10384673009** Collected: 04/07/17 10:20 Received: 04/12/17 11:15 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>21.5</b>	%	0.10	0.10	1		04/18/17 13:17		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;27.1</b>	ug/kg	64.8	27.1	1	04/14/17 11:00	04/15/17 08:34	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;14.4</b>	ug/kg	64.8	14.4	1	04/14/17 11:00	04/15/17 08:34	79-34-5	
1,1,2-Trichloroethane	<b>&lt;14.0</b>	ug/kg	64.8	14.0	1	04/14/17 11:00	04/15/17 08:34	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;46.7</b>	ug/kg	259	46.7	1	04/14/17 11:00	04/15/17 08:34	76-13-1	
1,1-Dichloroethane	<b>&lt;25.2</b>	ug/kg	64.8	25.2	1	04/14/17 11:00	04/15/17 08:34	75-34-3	
1,1-Dichloroethene	<b>&lt;16.5</b>	ug/kg	64.8	16.5	1	04/14/17 11:00	04/15/17 08:34	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;20.0</b>	ug/kg	64.8	20.0	1	04/14/17 11:00	04/15/17 08:34	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;14.3</b>	ug/kg	64.8	14.3	1	04/14/17 11:00	04/15/17 08:34	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;24.4</b>	ug/kg	64.8	24.4	1	04/14/17 11:00	04/15/17 08:34	106-93-4	
1,2-Dichlorobenzene	<b>&lt;12.5</b>	ug/kg	64.8	12.5	1	04/14/17 11:00	04/15/17 08:34	95-50-1	
1,2-Dichloroethane	<b>&lt;20.5</b>	ug/kg	64.8	20.5	1	04/14/17 11:00	04/15/17 08:34	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;14.9</b>	ug/kg	64.8	14.9	1	04/14/17 11:00	04/15/17 08:34	108-67-8	
1,3-Dichlorobenzene	<b>&lt;19.1</b>	ug/kg	64.8	19.1	1	04/14/17 11:00	04/15/17 08:34	541-73-1	
1,4-Dichlorobenzene	<b>&lt;18.8</b>	ug/kg	64.8	18.8	1	04/14/17 11:00	04/15/17 08:34	106-46-7	
2-Butanone (MEK)	<b>&lt;85.6</b>	ug/kg	324	85.6	1	04/14/17 11:00	04/15/17 08:34	78-93-3	
2-Hexanone	<b>&lt;76.4</b>	ug/kg	324	76.4	1	04/14/17 11:00	04/15/17 08:34	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;42.9</b>	ug/kg	324	42.9	1	04/14/17 11:00	04/15/17 08:34	108-10-1	
Acetone	<b>&lt;425</b>	ug/kg	1300	425	1	04/14/17 11:00	04/15/17 08:34	67-64-1	
Benzene	<b>&lt;5.6</b>	ug/kg	25.9	5.6	1	04/14/17 11:00	04/15/17 08:34	71-43-2	
Bromodichloromethane	<b>&lt;18.2</b>	ug/kg	64.8	18.2	1	04/14/17 11:00	04/15/17 08:34	75-27-4	
Bromoform	<b>&lt;55.9</b>	ug/kg	259	55.9	1	04/14/17 11:00	04/15/17 08:34	75-25-2	
Bromomethane	<b>&lt;65.8</b>	ug/kg	648	65.8	1	04/14/17 11:00	04/15/17 08:34	74-83-9	
Carbon tetrachloride	<b>&lt;20.4</b>	ug/kg	64.8	20.4	1	04/14/17 11:00	04/15/17 08:34	56-23-5	
Chlorobenzene	<b>&lt;11.3</b>	ug/kg	64.8	11.3	1	04/14/17 11:00	04/15/17 08:34	108-90-7	
Chloroethane	<b>&lt;102</b>	ug/kg	648	102	1	04/14/17 11:00	04/15/17 08:34	75-00-3	
Chloroform	<b>&lt;31.5</b>	ug/kg	64.8	31.5	1	04/14/17 11:00	04/15/17 08:34	67-66-3	
Chloromethane	<b>&lt;31.4</b>	ug/kg	259	31.4	1	04/14/17 11:00	04/15/17 08:34	74-87-3	
Dibromochloromethane	<b>&lt;55.6</b>	ug/kg	259	55.6	1	04/14/17 11:00	04/15/17 08:34	124-48-1	
Dichlorodifluoromethane	<b>&lt;19.8</b>	ug/kg	259	19.8	1	04/14/17 11:00	04/15/17 08:34	75-71-8	
Ethylbenzene	<b>&lt;20.6</b>	ug/kg	64.8	20.6	1	04/14/17 11:00	04/15/17 08:34	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;61.0</b>	ug/kg	324	61.0	1	04/14/17 11:00	04/15/17 08:34	87-68-3	
Methyl-tert-butyl ether	<b>&lt;12.1</b>	ug/kg	64.8	12.1	1	04/14/17 11:00	04/15/17 08:34	1634-04-4	
Methylene Chloride	<b>&lt;120</b>	ug/kg	259	120	1	04/14/17 11:00	04/15/17 08:34	75-09-2	
Naphthalene	<b>&lt;15.7</b>	ug/kg	259	15.7	1	04/14/17 11:00	04/15/17 08:34	91-20-3	
Styrene	<b>&lt;16.9</b>	ug/kg	64.8	16.9	1	04/14/17 11:00	04/15/17 08:34	100-42-5	
Tetrachloroethene	<b>&lt;24.8</b>	ug/kg	64.8	24.8	1	04/14/17 11:00	04/15/17 08:34	127-18-4	
Tetrahydrofuran	<b>&lt;322</b>	ug/kg	2590	322	1	04/14/17 11:00	04/15/17 08:34	109-99-9	
Toluene	<b>&lt;20.6</b>	ug/kg	64.8	20.6	1	04/14/17 11:00	04/15/17 08:34	108-88-3	
Trichloroethene	<b>&lt;18.5</b>	ug/kg	64.8	18.5	1	04/14/17 11:00	04/15/17 08:34	79-01-6	
Trichlorofluoromethane	<b>&lt;65.1</b>	ug/kg	259	65.1	1	04/14/17 11:00	04/15/17 08:34	75-69-4	
Vinyl acetate	<b>&lt;68.6</b>	ug/kg	648	68.6	1	04/14/17 11:00	04/15/17 08:34	108-05-4	
Vinyl chloride	<b>&lt;8.3</b>	ug/kg	25.9	8.3	1	04/14/17 11:00	04/15/17 08:34	75-01-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-45**      **Lab ID: 10384673009**      Collected: 04/07/17 10:20      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<24.1	ug/kg	64.8	24.1	1	04/14/17 11:00	04/15/17 08:34	156-59-2	
cis-1,3-Dichloropropene	<29.6	ug/kg	64.8	29.6	1	04/14/17 11:00	04/15/17 08:34	10061-01-5	
m&p-Xylene	<32.6	ug/kg	130	32.6	1	04/14/17 11:00	04/15/17 08:34	179601-23-1	
o-Xylene	<19.3	ug/kg	64.8	19.3	1	04/14/17 11:00	04/15/17 08:34	95-47-6	
trans-1,2-Dichloroethene	<31.3	ug/kg	64.8	31.3	1	04/14/17 11:00	04/15/17 08:34	156-60-5	
trans-1,3-Dichloropropene	<22.0	ug/kg	259	22.0	1	04/14/17 11:00	04/15/17 08:34	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-125		1	04/14/17 11:00	04/15/17 08:34	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 08:34	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 08:34	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-50**      **Lab ID: 10384673010**      Collected: 04/07/17 10:45      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>28.1</b>	%	0.10	0.10	1		04/18/17 13:17		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;30.5</b>	ug/kg	73.1	30.5	1	04/14/17 11:00	04/15/17 08:52	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;16.2</b>	ug/kg	73.1	16.2	1	04/14/17 11:00	04/15/17 08:52	79-34-5	
1,1,2-Trichloroethane	<b>&lt;15.8</b>	ug/kg	73.1	15.8	1	04/14/17 11:00	04/15/17 08:52	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;52.6</b>	ug/kg	292	52.6	1	04/14/17 11:00	04/15/17 08:52	76-13-1	
1,1-Dichloroethane	<b>&lt;28.3</b>	ug/kg	73.1	28.3	1	04/14/17 11:00	04/15/17 08:52	75-34-3	
1,1-Dichloroethene	<b>&lt;18.6</b>	ug/kg	73.1	18.6	1	04/14/17 11:00	04/15/17 08:52	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;22.5</b>	ug/kg	73.1	22.5	1	04/14/17 11:00	04/15/17 08:52	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;16.1</b>	ug/kg	73.1	16.1	1	04/14/17 11:00	04/15/17 08:52	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;27.5</b>	ug/kg	73.1	27.5	1	04/14/17 11:00	04/15/17 08:52	106-93-4	
1,2-Dichlorobenzene	<b>&lt;14.1</b>	ug/kg	73.1	14.1	1	04/14/17 11:00	04/15/17 08:52	95-50-1	
1,2-Dichloroethane	<b>&lt;23.1</b>	ug/kg	73.1	23.1	1	04/14/17 11:00	04/15/17 08:52	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;16.8</b>	ug/kg	73.1	16.8	1	04/14/17 11:00	04/15/17 08:52	108-67-8	
1,3-Dichlorobenzene	<b>&lt;21.5</b>	ug/kg	73.1	21.5	1	04/14/17 11:00	04/15/17 08:52	541-73-1	
1,4-Dichlorobenzene	<b>&lt;21.2</b>	ug/kg	73.1	21.2	1	04/14/17 11:00	04/15/17 08:52	106-46-7	
2-Butanone (MEK)	<b>&lt;96.4</b>	ug/kg	365	96.4	1	04/14/17 11:00	04/15/17 08:52	78-93-3	
2-Hexanone	<b>&lt;86.1</b>	ug/kg	365	86.1	1	04/14/17 11:00	04/15/17 08:52	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;48.4</b>	ug/kg	365	48.4	1	04/14/17 11:00	04/15/17 08:52	108-10-1	
Acetone	<b>&lt;479</b>	ug/kg	1460	479	1	04/14/17 11:00	04/15/17 08:52	67-64-1	
Benzene	<b>&lt;6.3</b>	ug/kg	29.2	6.3	1	04/14/17 11:00	04/15/17 08:52	71-43-2	
Bromodichloromethane	<b>&lt;20.5</b>	ug/kg	73.1	20.5	1	04/14/17 11:00	04/15/17 08:52	75-27-4	
Bromoform	<b>&lt;63.0</b>	ug/kg	292	63.0	1	04/14/17 11:00	04/15/17 08:52	75-25-2	
Bromomethane	<b>&lt;74.1</b>	ug/kg	731	74.1	1	04/14/17 11:00	04/15/17 08:52	74-83-9	
Carbon tetrachloride	<b>&lt;22.9</b>	ug/kg	73.1	22.9	1	04/14/17 11:00	04/15/17 08:52	56-23-5	
Chlorobenzene	<b>&lt;12.7</b>	ug/kg	73.1	12.7	1	04/14/17 11:00	04/15/17 08:52	108-90-7	
Chloroethane	<b>&lt;115</b>	ug/kg	731	115	1	04/14/17 11:00	04/15/17 08:52	75-00-3	
Chloroform	<b>&lt;35.5</b>	ug/kg	73.1	35.5	1	04/14/17 11:00	04/15/17 08:52	67-66-3	
Chloromethane	<b>&lt;35.4</b>	ug/kg	292	35.4	1	04/14/17 11:00	04/15/17 08:52	74-87-3	
Dibromochloromethane	<b>&lt;62.7</b>	ug/kg	292	62.7	1	04/14/17 11:00	04/15/17 08:52	124-48-1	
Dichlorodifluoromethane	<b>&lt;22.4</b>	ug/kg	292	22.4	1	04/14/17 11:00	04/15/17 08:52	75-71-8	
Ethylbenzene	<b>&lt;23.2</b>	ug/kg	73.1	23.2	1	04/14/17 11:00	04/15/17 08:52	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;68.7</b>	ug/kg	365	68.7	1	04/14/17 11:00	04/15/17 08:52	87-68-3	
Methyl-tert-butyl ether	<b>&lt;13.7</b>	ug/kg	73.1	13.7	1	04/14/17 11:00	04/15/17 08:52	1634-04-4	
Methylene Chloride	<b>&lt;135</b>	ug/kg	292	135	1	04/14/17 11:00	04/15/17 08:52	75-09-2	
Naphthalene	<b>&lt;17.7</b>	ug/kg	292	17.7	1	04/14/17 11:00	04/15/17 08:52	91-20-3	
Styrene	<b>&lt;19.0</b>	ug/kg	73.1	19.0	1	04/14/17 11:00	04/15/17 08:52	100-42-5	
Tetrachloroethene	<b>&lt;27.9</b>	ug/kg	73.1	27.9	1	04/14/17 11:00	04/15/17 08:52	127-18-4	
Tetrahydrofuran	<b>&lt;362</b>	ug/kg	2920	362	1	04/14/17 11:00	04/15/17 08:52	109-99-9	
Toluene	<b>&lt;23.2</b>	ug/kg	73.1	23.2	1	04/14/17 11:00	04/15/17 08:52	108-88-3	
Trichloroethene	<b>&lt;20.9</b>	ug/kg	73.1	20.9	1	04/14/17 11:00	04/15/17 08:52	79-01-6	
Trichlorofluoromethane	<b>&lt;73.4</b>	ug/kg	292	73.4	1	04/14/17 11:00	04/15/17 08:52	75-69-4	
Vinyl acetate	<b>&lt;77.3</b>	ug/kg	731	77.3	1	04/14/17 11:00	04/15/17 08:52	108-05-4	
Vinyl chloride	<b>&lt;9.4</b>	ug/kg	29.2	9.4	1	04/14/17 11:00	04/15/17 08:52	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-50**      **Lab ID: 10384673010**      Collected: 04/07/17 10:45      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<27.2	ug/kg	73.1	27.2	1	04/14/17 11:00	04/15/17 08:52	156-59-2	
cis-1,3-Dichloropropene	<33.3	ug/kg	73.1	33.3	1	04/14/17 11:00	04/15/17 08:52	10061-01-5	
m&p-Xylene	<36.7	ug/kg	146	36.7	1	04/14/17 11:00	04/15/17 08:52	179601-23-1	
o-Xylene	<21.8	ug/kg	73.1	21.8	1	04/14/17 11:00	04/15/17 08:52	95-47-6	
trans-1,2-Dichloroethene	<35.2	ug/kg	73.1	35.2	1	04/14/17 11:00	04/15/17 08:52	156-60-5	
trans-1,3-Dichloropropene	<24.8	ug/kg	292	24.8	1	04/14/17 11:00	04/15/17 08:52	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-125		1	04/14/17 11:00	04/15/17 08:52	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1	04/14/17 11:00	04/15/17 08:52	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1	04/14/17 11:00	04/15/17 08:52	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

Sample: **SB44-SS-55** Lab ID: **10384673011** Collected: 04/07/17 10:50 Received: 04/12/17 11:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>									
Analytical Method: ASTM D2974									
Percent Moisture	<b>26.7</b>	%	0.10	0.10	1		04/18/17 13:18		
<b>8260B MSV 5030 Med Level</b>									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,1-Trichloroethane	<b>&lt;29.1</b>	ug/kg	69.6	29.1	1	04/14/17 11:00	04/14/17 13:47	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;15.5</b>	ug/kg	69.6	15.5	1	04/14/17 11:00	04/14/17 13:47	79-34-5	
1,1,2-Trichloroethane	<b>&lt;15.0</b>	ug/kg	69.6	15.0	1	04/14/17 11:00	04/14/17 13:47	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;50.1</b>	ug/kg	279	50.1	1	04/14/17 11:00	04/14/17 13:47	76-13-1	
1,1-Dichloroethane	<b>&lt;27.0</b>	ug/kg	69.6	27.0	1	04/14/17 11:00	04/14/17 13:47	75-34-3	
1,1-Dichloroethene	<b>&lt;17.7</b>	ug/kg	69.6	17.7	1	04/14/17 11:00	04/14/17 13:47	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;21.4</b>	ug/kg	69.6	21.4	1	04/14/17 11:00	04/14/17 13:47	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;15.3</b>	ug/kg	69.6	15.3	1	04/14/17 11:00	04/14/17 13:47	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;26.2</b>	ug/kg	69.6	26.2	1	04/14/17 11:00	04/14/17 13:47	106-93-4	
1,2-Dichlorobenzene	<b>&lt;13.5</b>	ug/kg	69.6	13.5	1	04/14/17 11:00	04/14/17 13:47	95-50-1	
1,2-Dichloroethane	<b>&lt;22.0</b>	ug/kg	69.6	22.0	1	04/14/17 11:00	04/14/17 13:47	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;16.0</b>	ug/kg	69.6	16.0	1	04/14/17 11:00	04/14/17 13:47	108-67-8	
1,3-Dichlorobenzene	<b>&lt;20.5</b>	ug/kg	69.6	20.5	1	04/14/17 11:00	04/14/17 13:47	541-73-1	
1,4-Dichlorobenzene	<b>&lt;20.2</b>	ug/kg	69.6	20.2	1	04/14/17 11:00	04/14/17 13:47	106-46-7	
2-Butanone (MEK)	<b>&lt;91.9</b>	ug/kg	348	91.9	1	04/14/17 11:00	04/14/17 13:47	78-93-3	
2-Hexanone	<b>&lt;82.0</b>	ug/kg	348	82.0	1	04/14/17 11:00	04/14/17 13:47	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;46.1</b>	ug/kg	348	46.1	1	04/14/17 11:00	04/14/17 13:47	108-10-1	
Acetone	<b>&lt;457</b>	ug/kg	1390	457	1	04/14/17 11:00	04/14/17 13:47	67-64-1	
Benzene	<b>&lt;6.0</b>	ug/kg	27.9	6.0	1	04/14/17 11:00	04/14/17 13:47	71-43-2	
Bromodichloromethane	<b>&lt;19.5</b>	ug/kg	69.6	19.5	1	04/14/17 11:00	04/14/17 13:47	75-27-4	
Bromoform	<b>&lt;60.0</b>	ug/kg	279	60.0	1	04/14/17 11:00	04/14/17 13:47	75-25-2	
Bromomethane	<b>&lt;70.6</b>	ug/kg	696	70.6	1	04/14/17 11:00	04/14/17 13:47	74-83-9	
Carbon tetrachloride	<b>&lt;21.9</b>	ug/kg	69.6	21.9	1	04/14/17 11:00	04/14/17 13:47	56-23-5	
Chlorobenzene	<b>&lt;12.1</b>	ug/kg	69.6	12.1	1	04/14/17 11:00	04/14/17 13:47	108-90-7	
Chloroethane	<b>&lt;110</b>	ug/kg	696	110	1	04/14/17 11:00	04/14/17 13:47	75-00-3	
Chloroform	<b>&lt;33.8</b>	ug/kg	69.6	33.8	1	04/14/17 11:00	04/14/17 13:47	67-66-3	
Chloromethane	<b>&lt;33.7</b>	ug/kg	279	33.7	1	04/14/17 11:00	04/14/17 13:47	74-87-3	
Dibromochloromethane	<b>&lt;59.8</b>	ug/kg	279	59.8	1	04/14/17 11:00	04/14/17 13:47	124-48-1	
Dichlorodifluoromethane	<b>&lt;21.3</b>	ug/kg	279	21.3	1	04/14/17 11:00	04/14/17 13:47	75-71-8	M1
Ethylbenzene	<b>&lt;22.1</b>	ug/kg	69.6	22.1	1	04/14/17 11:00	04/14/17 13:47	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;65.5</b>	ug/kg	348	65.5	1	04/14/17 11:00	04/14/17 13:47	87-68-3	
Methyl-tert-butyl ether	<b>&lt;13.0</b>	ug/kg	69.6	13.0	1	04/14/17 11:00	04/14/17 13:47	1634-04-4	
Methylene Chloride	<b>&lt;129</b>	ug/kg	279	129	1	04/14/17 11:00	04/14/17 13:47	75-09-2	
Naphthalene	<b>&lt;16.9</b>	ug/kg	279	16.9	1	04/14/17 11:00	04/14/17 13:47	91-20-3	
Styrene	<b>&lt;18.1</b>	ug/kg	69.6	18.1	1	04/14/17 11:00	04/14/17 13:47	100-42-5	
Tetrachloroethene	<b>&lt;26.6</b>	ug/kg	69.6	26.6	1	04/14/17 11:00	04/14/17 13:47	127-18-4	
Tetrahydrofuran	<b>&lt;345</b>	ug/kg	2790	345	1	04/14/17 11:00	04/14/17 13:47	109-99-9	
Toluene	<b>&lt;22.1</b>	ug/kg	69.6	22.1	1	04/14/17 11:00	04/14/17 13:47	108-88-3	
Trichloroethene	<b>&lt;19.9</b>	ug/kg	69.6	19.9	1	04/14/17 11:00	04/14/17 13:47	79-01-6	
Trichlorofluoromethane	<b>&lt;69.9</b>	ug/kg	279	69.9	1	04/14/17 11:00	04/14/17 13:47	75-69-4	
Vinyl acetate	<b>&lt;73.7</b>	ug/kg	696	73.7	1	04/14/17 11:00	04/14/17 13:47	108-05-4	
Vinyl chloride	<b>&lt;8.9</b>	ug/kg	27.9	8.9	1	04/14/17 11:00	04/14/17 13:47	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-55**      **Lab ID: 10384673011**      Collected: 04/07/17 10:50      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<25.9	ug/kg	69.6	25.9	1	04/14/17 11:00	04/14/17 13:47	156-59-2	
cis-1,3-Dichloropropene	<31.8	ug/kg	69.6	31.8	1	04/14/17 11:00	04/14/17 13:47	10061-01-5	
m&p-Xylene	<35.0	ug/kg	139	35.0	1	04/14/17 11:00	04/14/17 13:47	179601-23-1	
o-Xylene	<20.8	ug/kg	69.6	20.8	1	04/14/17 11:00	04/14/17 13:47	95-47-6	
trans-1,2-Dichloroethene	<33.6	ug/kg	69.6	33.6	1	04/14/17 11:00	04/14/17 13:47	156-60-5	
trans-1,3-Dichloropropene	<23.7	ug/kg	279	23.7	1	04/14/17 11:00	04/14/17 13:47	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-125		1	04/14/17 11:00	04/14/17 13:47	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1	04/14/17 11:00	04/14/17 13:47	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/14/17 11:00	04/14/17 13:47	460-00-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-60**      **Lab ID: 10384673012**      Collected: 04/07/17 11:15      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>28.8</b>	%	0.10	0.10	1		04/18/17 13:18		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;28.6</b>	ug/kg	68.5	28.6	1	04/14/17 11:00	04/15/17 09:28	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;15.2</b>	ug/kg	68.5	15.2	1	04/14/17 11:00	04/15/17 09:28	79-34-5	
1,1,2-Trichloroethane	<b>&lt;14.8</b>	ug/kg	68.5	14.8	1	04/14/17 11:00	04/15/17 09:28	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;49.3</b>	ug/kg	274	49.3	1	04/14/17 11:00	04/15/17 09:28	76-13-1	
1,1-Dichloroethane	<b>&lt;26.6</b>	ug/kg	68.5	26.6	1	04/14/17 11:00	04/15/17 09:28	75-34-3	
1,1-Dichloroethene	<b>&lt;17.4</b>	ug/kg	68.5	17.4	1	04/14/17 11:00	04/15/17 09:28	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;21.1</b>	ug/kg	68.5	21.1	1	04/14/17 11:00	04/15/17 09:28	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;15.1</b>	ug/kg	68.5	15.1	1	04/14/17 11:00	04/15/17 09:28	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;25.7</b>	ug/kg	68.5	25.7	1	04/14/17 11:00	04/15/17 09:28	106-93-4	
1,2-Dichlorobenzene	<b>&lt;13.2</b>	ug/kg	68.5	13.2	1	04/14/17 11:00	04/15/17 09:28	95-50-1	
1,2-Dichloroethane	<b>&lt;21.6</b>	ug/kg	68.5	21.6	1	04/14/17 11:00	04/15/17 09:28	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;15.8</b>	ug/kg	68.5	15.8	1	04/14/17 11:00	04/15/17 09:28	108-67-8	
1,3-Dichlorobenzene	<b>&lt;20.1</b>	ug/kg	68.5	20.1	1	04/14/17 11:00	04/15/17 09:28	541-73-1	
1,4-Dichlorobenzene	<b>&lt;19.9</b>	ug/kg	68.5	19.9	1	04/14/17 11:00	04/15/17 09:28	106-46-7	
2-Butanone (MEK)	<b>&lt;90.4</b>	ug/kg	342	90.4	1	04/14/17 11:00	04/15/17 09:28	78-93-3	
2-Hexanone	<b>&lt;80.7</b>	ug/kg	342	80.7	1	04/14/17 11:00	04/15/17 09:28	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;45.3</b>	ug/kg	342	45.3	1	04/14/17 11:00	04/15/17 09:28	108-10-1	
Acetone	<b>&lt;449</b>	ug/kg	1370	449	1	04/14/17 11:00	04/15/17 09:28	67-64-1	
Benzene	<b>&lt;5.9</b>	ug/kg	27.4	5.9	1	04/14/17 11:00	04/15/17 09:28	71-43-2	
Bromodichloromethane	<b>&lt;19.2</b>	ug/kg	68.5	19.2	1	04/14/17 11:00	04/15/17 09:28	75-27-4	
Bromoform	<b>&lt;59.0</b>	ug/kg	274	59.0	1	04/14/17 11:00	04/15/17 09:28	75-25-2	
Bromomethane	<b>&lt;69.4</b>	ug/kg	685	69.4	1	04/14/17 11:00	04/15/17 09:28	74-83-9	
Carbon tetrachloride	<b>&lt;21.5</b>	ug/kg	68.5	21.5	1	04/14/17 11:00	04/15/17 09:28	56-23-5	
Chlorobenzene	<b>&lt;11.9</b>	ug/kg	68.5	11.9	1	04/14/17 11:00	04/15/17 09:28	108-90-7	
Chloroethane	<b>&lt;108</b>	ug/kg	685	108	1	04/14/17 11:00	04/15/17 09:28	75-00-3	
Chloroform	<b>&lt;33.3</b>	ug/kg	68.5	33.3	1	04/14/17 11:00	04/15/17 09:28	67-66-3	
Chloromethane	<b>&lt;33.1</b>	ug/kg	274	33.1	1	04/14/17 11:00	04/15/17 09:28	74-87-3	
Dibromochloromethane	<b>&lt;58.8</b>	ug/kg	274	58.8	1	04/14/17 11:00	04/15/17 09:28	124-48-1	
Dichlorodifluoromethane	<b>&lt;21.0</b>	ug/kg	274	21.0	1	04/14/17 11:00	04/15/17 09:28	75-71-8	
Ethylbenzene	<b>&lt;21.8</b>	ug/kg	68.5	21.8	1	04/14/17 11:00	04/15/17 09:28	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;64.4</b>	ug/kg	342	64.4	1	04/14/17 11:00	04/15/17 09:28	87-68-3	
Methyl-tert-butyl ether	<b>&lt;12.8</b>	ug/kg	68.5	12.8	1	04/14/17 11:00	04/15/17 09:28	1634-04-4	
Methylene Chloride	<b>&lt;127</b>	ug/kg	274	127	1	04/14/17 11:00	04/15/17 09:28	75-09-2	
Naphthalene	<b>&lt;16.6</b>	ug/kg	274	16.6	1	04/14/17 11:00	04/15/17 09:28	91-20-3	
Styrene	<b>&lt;17.8</b>	ug/kg	68.5	17.8	1	04/14/17 11:00	04/15/17 09:28	100-42-5	
Tetrachloroethene	<b>&lt;26.2</b>	ug/kg	68.5	26.2	1	04/14/17 11:00	04/15/17 09:28	127-18-4	
Tetrahydrofuran	<b>&lt;340</b>	ug/kg	2740	340	1	04/14/17 11:00	04/15/17 09:28	109-99-9	
Toluene	<b>&lt;21.8</b>	ug/kg	68.5	21.8	1	04/14/17 11:00	04/15/17 09:28	108-88-3	
Trichloroethene	<b>&lt;19.6</b>	ug/kg	68.5	19.6	1	04/14/17 11:00	04/15/17 09:28	79-01-6	
Trichlorofluoromethane	<b>&lt;68.8</b>	ug/kg	274	68.8	1	04/14/17 11:00	04/15/17 09:28	75-69-4	
Vinyl acetate	<b>&lt;72.5</b>	ug/kg	685	72.5	1	04/14/17 11:00	04/15/17 09:28	108-05-4	
Vinyl chloride	<b>&lt;8.8</b>	ug/kg	27.4	8.8	1	04/14/17 11:00	04/15/17 09:28	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-60**      **Lab ID: 10384673012**      Collected: 04/07/17 11:15      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<25.5	ug/kg	68.5	25.5	1	04/14/17 11:00	04/15/17 09:28	156-59-2	
cis-1,3-Dichloropropene	<31.2	ug/kg	68.5	31.2	1	04/14/17 11:00	04/15/17 09:28	10061-01-5	
m&p-Xylene	<34.4	ug/kg	137	34.4	1	04/14/17 11:00	04/15/17 09:28	179601-23-1	
o-Xylene	<20.4	ug/kg	68.5	20.4	1	04/14/17 11:00	04/15/17 09:28	95-47-6	
trans-1,2-Dichloroethene	<33.0	ug/kg	68.5	33.0	1	04/14/17 11:00	04/15/17 09:28	156-60-5	
trans-1,3-Dichloropropene	<23.3	ug/kg	274	23.3	1	04/14/17 11:00	04/15/17 09:28	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 09:28	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1	04/14/17 11:00	04/15/17 09:28	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1	04/14/17 11:00	04/15/17 09:28	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-65**      **Lab ID: 10384673013**      Collected: 04/07/17 11:20      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>34.4</b>	%	0.10	0.10	1		04/18/17 13:18		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;30.4</b>	ug/kg	72.8	30.4	1	04/14/17 11:00	04/15/17 09:10	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;16.2</b>	ug/kg	72.8	16.2	1	04/14/17 11:00	04/15/17 09:10	79-34-5	
1,1,2-Trichloroethane	<b>&lt;15.7</b>	ug/kg	72.8	15.7	1	04/14/17 11:00	04/15/17 09:10	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;52.4</b>	ug/kg	291	52.4	1	04/14/17 11:00	04/15/17 09:10	76-13-1	
1,1-Dichloroethane	<b>&lt;28.3</b>	ug/kg	72.8	28.3	1	04/14/17 11:00	04/15/17 09:10	75-34-3	
1,1-Dichloroethene	<b>&lt;18.5</b>	ug/kg	72.8	18.5	1	04/14/17 11:00	04/15/17 09:10	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;22.4</b>	ug/kg	72.8	22.4	1	04/14/17 11:00	04/15/17 09:10	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;16.0</b>	ug/kg	72.8	16.0	1	04/14/17 11:00	04/15/17 09:10	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;27.4</b>	ug/kg	72.8	27.4	1	04/14/17 11:00	04/15/17 09:10	106-93-4	
1,2-Dichlorobenzene	<b>&lt;14.1</b>	ug/kg	72.8	14.1	1	04/14/17 11:00	04/15/17 09:10	95-50-1	
1,2-Dichloroethane	<b>&lt;23.0</b>	ug/kg	72.8	23.0	1	04/14/17 11:00	04/15/17 09:10	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;16.8</b>	ug/kg	72.8	16.8	1	04/14/17 11:00	04/15/17 09:10	108-67-8	
1,3-Dichlorobenzene	<b>&lt;21.4</b>	ug/kg	72.8	21.4	1	04/14/17 11:00	04/15/17 09:10	541-73-1	
1,4-Dichlorobenzene	<b>&lt;21.1</b>	ug/kg	72.8	21.1	1	04/14/17 11:00	04/15/17 09:10	106-46-7	
2-Butanone (MEK)	<b>&lt;96.1</b>	ug/kg	364	96.1	1	04/14/17 11:00	04/15/17 09:10	78-93-3	
2-Hexanone	<b>&lt;85.8</b>	ug/kg	364	85.8	1	04/14/17 11:00	04/15/17 09:10	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;48.2</b>	ug/kg	364	48.2	1	04/14/17 11:00	04/15/17 09:10	108-10-1	
Acetone	<b>&lt;478</b>	ug/kg	1460	478	1	04/14/17 11:00	04/15/17 09:10	67-64-1	
Benzene	<b>&lt;6.3</b>	ug/kg	29.1	6.3	1	04/14/17 11:00	04/15/17 09:10	71-43-2	
Bromodichloromethane	<b>&lt;20.4</b>	ug/kg	72.8	20.4	1	04/14/17 11:00	04/15/17 09:10	75-27-4	
Bromoform	<b>&lt;62.8</b>	ug/kg	291	62.8	1	04/14/17 11:00	04/15/17 09:10	75-25-2	
Bromomethane	<b>&lt;73.9</b>	ug/kg	728	73.9	1	04/14/17 11:00	04/15/17 09:10	74-83-9	
Carbon tetrachloride	<b>&lt;22.9</b>	ug/kg	72.8	22.9	1	04/14/17 11:00	04/15/17 09:10	56-23-5	
Chlorobenzene	<b>&lt;12.7</b>	ug/kg	72.8	12.7	1	04/14/17 11:00	04/15/17 09:10	108-90-7	
Chloroethane	<b>&lt;115</b>	ug/kg	728	115	1	04/14/17 11:00	04/15/17 09:10	75-00-3	
Chloroform	<b>&lt;35.4</b>	ug/kg	72.8	35.4	1	04/14/17 11:00	04/15/17 09:10	67-66-3	
Chloromethane	<b>&lt;35.3</b>	ug/kg	291	35.3	1	04/14/17 11:00	04/15/17 09:10	74-87-3	
Dibromochloromethane	<b>&lt;62.5</b>	ug/kg	291	62.5	1	04/14/17 11:00	04/15/17 09:10	124-48-1	
Dichlorodifluoromethane	<b>&lt;22.3</b>	ug/kg	291	22.3	1	04/14/17 11:00	04/15/17 09:10	75-71-8	
Ethylbenzene	<b>&lt;23.2</b>	ug/kg	72.8	23.2	1	04/14/17 11:00	04/15/17 09:10	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;68.5</b>	ug/kg	364	68.5	1	04/14/17 11:00	04/15/17 09:10	87-68-3	
Methyl-tert-butyl ether	<b>&lt;13.6</b>	ug/kg	72.8	13.6	1	04/14/17 11:00	04/15/17 09:10	1634-04-4	
Methylene Chloride	<b>&lt;135</b>	ug/kg	291	135	1	04/14/17 11:00	04/15/17 09:10	75-09-2	
Naphthalene	<b>&lt;17.6</b>	ug/kg	291	17.6	1	04/14/17 11:00	04/15/17 09:10	91-20-3	
Styrene	<b>&lt;18.9</b>	ug/kg	72.8	18.9	1	04/14/17 11:00	04/15/17 09:10	100-42-5	
Tetrachloroethene	<b>&lt;27.8</b>	ug/kg	72.8	27.8	1	04/14/17 11:00	04/15/17 09:10	127-18-4	
Tetrahydrofuran	<b>&lt;361</b>	ug/kg	2910	361	1	04/14/17 11:00	04/15/17 09:10	109-99-9	
Toluene	<b>&lt;23.2</b>	ug/kg	72.8	23.2	1	04/14/17 11:00	04/15/17 09:10	108-88-3	
Trichloroethene	<b>&lt;20.8</b>	ug/kg	72.8	20.8	1	04/14/17 11:00	04/15/17 09:10	79-01-6	
Trichlorofluoromethane	<b>&lt;73.1</b>	ug/kg	291	73.1	1	04/14/17 11:00	04/15/17 09:10	75-69-4	
Vinyl acetate	<b>&lt;77.1</b>	ug/kg	728	77.1	1	04/14/17 11:00	04/15/17 09:10	108-05-4	
Vinyl chloride	<b>&lt;9.4</b>	ug/kg	29.1	9.4	1	04/14/17 11:00	04/15/17 09:10	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-65**      **Lab ID: 10384673013**      Collected: 04/07/17 11:20      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<27.1	ug/kg	72.8	27.1	1	04/14/17 11:00	04/15/17 09:10	156-59-2	
cis-1,3-Dichloropropene	<33.2	ug/kg	72.8	33.2	1	04/14/17 11:00	04/15/17 09:10	10061-01-5	
m&p-Xylene	<36.6	ug/kg	146	36.6	1	04/14/17 11:00	04/15/17 09:10	179601-23-1	
o-Xylene	<21.7	ug/kg	72.8	21.7	1	04/14/17 11:00	04/15/17 09:10	95-47-6	
trans-1,2-Dichloroethene	<35.1	ug/kg	72.8	35.1	1	04/14/17 11:00	04/15/17 09:10	156-60-5	
trans-1,3-Dichloropropene	<24.8	ug/kg	291	24.8	1	04/14/17 11:00	04/15/17 09:10	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 09:10	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 09:10	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 09:10	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-70**      **Lab ID: 10384673014**      Collected: 04/07/17 11:50      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>35.3</b>	%	0.10	0.10	1		04/18/17 13:18		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;32.8</b>	ug/kg	78.4	32.8	1	04/14/17 11:00	04/15/17 09:46	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;17.4</b>	ug/kg	78.4	17.4	1	04/14/17 11:00	04/15/17 09:46	79-34-5	
1,1,2-Trichloroethane	<b>&lt;16.9</b>	ug/kg	78.4	16.9	1	04/14/17 11:00	04/15/17 09:46	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;56.4</b>	ug/kg	313	56.4	1	04/14/17 11:00	04/15/17 09:46	76-13-1	
1,1-Dichloroethane	<b>&lt;30.4</b>	ug/kg	78.4	30.4	1	04/14/17 11:00	04/15/17 09:46	75-34-3	
1,1-Dichloroethene	<b>&lt;19.9</b>	ug/kg	78.4	19.9	1	04/14/17 11:00	04/15/17 09:46	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;24.1</b>	ug/kg	78.4	24.1	1	04/14/17 11:00	04/15/17 09:46	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;17.2</b>	ug/kg	78.4	17.2	1	04/14/17 11:00	04/15/17 09:46	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;29.5</b>	ug/kg	78.4	29.5	1	04/14/17 11:00	04/15/17 09:46	106-93-4	
1,2-Dichlorobenzene	<b>&lt;15.1</b>	ug/kg	78.4	15.1	1	04/14/17 11:00	04/15/17 09:46	95-50-1	
1,2-Dichloroethane	<b>&lt;24.8</b>	ug/kg	78.4	24.8	1	04/14/17 11:00	04/15/17 09:46	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;18.0</b>	ug/kg	78.4	18.0	1	04/14/17 11:00	04/15/17 09:46	108-67-8	
1,3-Dichlorobenzene	<b>&lt;23.0</b>	ug/kg	78.4	23.0	1	04/14/17 11:00	04/15/17 09:46	541-73-1	
1,4-Dichlorobenzene	<b>&lt;22.7</b>	ug/kg	78.4	22.7	1	04/14/17 11:00	04/15/17 09:46	106-46-7	
2-Butanone (MEK)	<b>&lt;103</b>	ug/kg	392	103	1	04/14/17 11:00	04/15/17 09:46	78-93-3	
2-Hexanone	<b>&lt;92.3</b>	ug/kg	392	92.3	1	04/14/17 11:00	04/15/17 09:46	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;51.9</b>	ug/kg	392	51.9	1	04/14/17 11:00	04/15/17 09:46	108-10-1	
Acetone	<b>&lt;514</b>	ug/kg	1570	514	1	04/14/17 11:00	04/15/17 09:46	67-64-1	
Benzene	<b>&lt;6.8</b>	ug/kg	31.3	6.8	1	04/14/17 11:00	04/15/17 09:46	71-43-2	
Bromodichloromethane	<b>&lt;21.9</b>	ug/kg	78.4	21.9	1	04/14/17 11:00	04/15/17 09:46	75-27-4	
Bromoform	<b>&lt;67.5</b>	ug/kg	313	67.5	1	04/14/17 11:00	04/15/17 09:46	75-25-2	
Bromomethane	<b>&lt;79.4</b>	ug/kg	784	79.4	1	04/14/17 11:00	04/15/17 09:46	74-83-9	
Carbon tetrachloride	<b>&lt;24.6</b>	ug/kg	78.4	24.6	1	04/14/17 11:00	04/15/17 09:46	56-23-5	
Chlorobenzene	<b>&lt;13.6</b>	ug/kg	78.4	13.6	1	04/14/17 11:00	04/15/17 09:46	108-90-7	
Chloroethane	<b>&lt;124</b>	ug/kg	784	124	1	04/14/17 11:00	04/15/17 09:46	75-00-3	
Chloroform	<b>&lt;38.1</b>	ug/kg	78.4	38.1	1	04/14/17 11:00	04/15/17 09:46	67-66-3	
Chloromethane	<b>&lt;37.9</b>	ug/kg	313	37.9	1	04/14/17 11:00	04/15/17 09:46	74-87-3	
Dibromochloromethane	<b>&lt;67.2</b>	ug/kg	313	67.2	1	04/14/17 11:00	04/15/17 09:46	124-48-1	
Dichlorodifluoromethane	<b>&lt;24.0</b>	ug/kg	313	24.0	1	04/14/17 11:00	04/15/17 09:46	75-71-8	
Ethylbenzene	<b>&lt;24.9</b>	ug/kg	78.4	24.9	1	04/14/17 11:00	04/15/17 09:46	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;73.7</b>	ug/kg	392	73.7	1	04/14/17 11:00	04/15/17 09:46	87-68-3	
Methyl-tert-butyl ether	<b>&lt;14.7</b>	ug/kg	78.4	14.7	1	04/14/17 11:00	04/15/17 09:46	1634-04-4	
Methylene Chloride	<b>&lt;145</b>	ug/kg	313	145	1	04/14/17 11:00	04/15/17 09:46	75-09-2	
Naphthalene	<b>&lt;19.0</b>	ug/kg	313	19.0	1	04/14/17 11:00	04/15/17 09:46	91-20-3	
Styrene	<b>&lt;20.4</b>	ug/kg	78.4	20.4	1	04/14/17 11:00	04/15/17 09:46	100-42-5	
Tetrachloroethene	<b>&lt;29.9</b>	ug/kg	78.4	29.9	1	04/14/17 11:00	04/15/17 09:46	127-18-4	
Tetrahydrofuran	<b>&lt;389</b>	ug/kg	3130	389	1	04/14/17 11:00	04/15/17 09:46	109-99-9	
Toluene	<b>&lt;24.9</b>	ug/kg	78.4	24.9	1	04/14/17 11:00	04/15/17 09:46	108-88-3	
Trichloroethene	<b>&lt;22.4</b>	ug/kg	78.4	22.4	1	04/14/17 11:00	04/15/17 09:46	79-01-6	
Trichlorofluoromethane	<b>&lt;78.7</b>	ug/kg	313	78.7	1	04/14/17 11:00	04/15/17 09:46	75-69-4	
Vinyl acetate	<b>&lt;82.9</b>	ug/kg	784	82.9	1	04/14/17 11:00	04/15/17 09:46	108-05-4	
Vinyl chloride	<b>&lt;10.1</b>	ug/kg	31.3	10.1	1	04/14/17 11:00	04/15/17 09:46	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-70**      **Lab ID: 10384673014**      Collected: 04/07/17 11:50      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<29.1	ug/kg	78.4	29.1	1	04/14/17 11:00	04/15/17 09:46	156-59-2	
cis-1,3-Dichloropropene	<35.7	ug/kg	78.4	35.7	1	04/14/17 11:00	04/15/17 09:46	10061-01-5	
m&p-Xylene	<39.3	ug/kg	157	39.3	1	04/14/17 11:00	04/15/17 09:46	179601-23-1	
o-Xylene	<23.3	ug/kg	78.4	23.3	1	04/14/17 11:00	04/15/17 09:46	95-47-6	
trans-1,2-Dichloroethene	<37.8	ug/kg	78.4	37.8	1	04/14/17 11:00	04/15/17 09:46	156-60-5	
trans-1,3-Dichloropropene	<26.6	ug/kg	313	26.6	1	04/14/17 11:00	04/15/17 09:46	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 09:46	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/14/17 11:00	04/15/17 09:46	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1	04/14/17 11:00	04/15/17 09:46	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

Sample: **SB44-SS-73** Lab ID: **10384673015** Collected: 04/07/17 11:55 Received: 04/12/17 11:15 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>11.5</b>	%	0.10	0.10	1		04/18/17 14:22		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;72.6</b>	ug/kg	174	72.6	1	04/13/17 12:56	04/14/17 21:15	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;38.6</b>	ug/kg	174	38.6	1	04/13/17 12:56	04/14/17 21:15	79-34-5	
1,1,2-Trichloroethane	<b>&lt;37.5</b>	ug/kg	174	37.5	1	04/13/17 12:56	04/14/17 21:15	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;125</b>	ug/kg	695	125	1	04/13/17 12:56	04/14/17 21:15	76-13-1	
1,1-Dichloroethane	<b>&lt;67.4</b>	ug/kg	174	67.4	1	04/13/17 12:56	04/14/17 21:15	75-34-3	
1,1-Dichloroethene	<b>&lt;44.1</b>	ug/kg	174	44.1	1	04/13/17 12:56	04/14/17 21:15	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;53.5</b>	ug/kg	174	53.5	1	04/13/17 12:56	04/14/17 21:15	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;38.2</b>	ug/kg	174	38.2	1	04/13/17 12:56	04/14/17 21:15	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;65.3</b>	ug/kg	174	65.3	1	04/13/17 12:56	04/14/17 21:15	106-93-4	
1,2-Dichlorobenzene	<b>&lt;33.6</b>	ug/kg	174	33.6	1	04/13/17 12:56	04/14/17 21:15	95-50-1	
1,2-Dichloroethane	<b>&lt;54.9</b>	ug/kg	174	54.9	1	04/13/17 12:56	04/14/17 21:15	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;40.0</b>	ug/kg	174	40.0	1	04/13/17 12:56	04/14/17 21:15	108-67-8	
1,3-Dichlorobenzene	<b>&lt;51.1</b>	ug/kg	174	51.1	1	04/13/17 12:56	04/14/17 21:15	541-73-1	
1,4-Dichlorobenzene	<b>&lt;50.4</b>	ug/kg	174	50.4	1	04/13/17 12:56	04/14/17 21:15	106-46-7	
2-Butanone (MEK)	<b>&lt;229</b>	ug/kg	869	229	1	04/13/17 12:56	04/14/17 21:15	78-93-3	
2-Hexanone	<b>&lt;205</b>	ug/kg	869	205	1	04/13/17 12:56	04/14/17 21:15	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;115</b>	ug/kg	869	115	1	04/13/17 12:56	04/14/17 21:15	108-10-1	
Acetone	<b>&lt;1140</b>	ug/kg	3470	1140	1	04/13/17 12:56	04/14/17 21:15	67-64-1	
Benzene	<b>&lt;15.0</b>	ug/kg	69.5	15.0	1	04/13/17 12:56	04/14/17 21:15	71-43-2	
Bromodichloromethane	<b>&lt;48.6</b>	ug/kg	174	48.6	1	04/13/17 12:56	04/14/17 21:15	75-27-4	
Bromoform	<b>&lt;150</b>	ug/kg	695	150	1	04/13/17 12:56	04/14/17 21:15	75-25-2	
Bromomethane	<b>&lt;176</b>	ug/kg	1740	176	1	04/13/17 12:56	04/14/17 21:15	74-83-9	
Carbon tetrachloride	<b>&lt;54.6</b>	ug/kg	174	54.6	1	04/13/17 12:56	04/14/17 21:15	56-23-5	
Chlorobenzene	<b>&lt;30.2</b>	ug/kg	174	30.2	1	04/13/17 12:56	04/14/17 21:15	108-90-7	
Chloroethane	<b>&lt;275</b>	ug/kg	1740	275	1	04/13/17 12:56	04/14/17 21:15	75-00-3	
Chloroform	<b>&lt;84.4</b>	ug/kg	174	84.4	1	04/13/17 12:56	04/14/17 21:15	67-66-3	
Chloromethane	<b>&lt;84.1</b>	ug/kg	695	84.1	1	04/13/17 12:56	04/14/17 21:15	74-87-3	
Dibromochloromethane	<b>&lt;149</b>	ug/kg	695	149	1	04/13/17 12:56	04/14/17 21:15	124-48-1	
Dichlorodifluoromethane	<b>&lt;53.2</b>	ug/kg	695	53.2	1	04/13/17 12:56	04/14/17 21:15	75-71-8	
Ethylbenzene	<b>&lt;55.3</b>	ug/kg	174	55.3	1	04/13/17 12:56	04/14/17 21:15	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;163</b>	ug/kg	869	163	1	04/13/17 12:56	04/14/17 21:15	87-68-3	
Methyl-tert-butyl ether	<b>&lt;32.5</b>	ug/kg	174	32.5	1	04/13/17 12:56	04/14/17 21:15	1634-04-4	
Methylene Chloride	<b>806</b>	ug/kg	695	322	1	04/13/17 12:56	04/14/17 21:15	75-09-2	
Naphthalene	<b>&lt;42.0</b>	ug/kg	695	42.0	1	04/13/17 12:56	04/14/17 21:15	91-20-3	
Styrene	<b>&lt;45.2</b>	ug/kg	174	45.2	1	04/13/17 12:56	04/14/17 21:15	100-42-5	
Tetrachloroethene	<b>&lt;66.4</b>	ug/kg	174	66.4	1	04/13/17 12:56	04/14/17 21:15	127-18-4	
Tetrahydrofuran	<b>&lt;862</b>	ug/kg	6950	862	1	04/13/17 12:56	04/14/17 21:15	109-99-9	
Toluene	<b>&lt;55.3</b>	ug/kg	174	55.3	1	04/13/17 12:56	04/14/17 21:15	108-88-3	
Trichloroethene	<b>&lt;49.7</b>	ug/kg	174	49.7	1	04/13/17 12:56	04/14/17 21:15	79-01-6	
Trichlorofluoromethane	<b>&lt;174</b>	ug/kg	695	174	1	04/13/17 12:56	04/14/17 21:15	75-69-4	
Vinyl acetate	<b>&lt;184</b>	ug/kg	1740	184	1	04/13/17 12:56	04/14/17 21:15	108-05-4	
Vinyl chloride	<b>&lt;22.3</b>	ug/kg	69.5	22.3	1	04/13/17 12:56	04/14/17 21:15	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: SB44-SS-73**      **Lab ID: 10384673015**      Collected: 04/07/17 11:55      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<64.6	ug/kg	174	64.6	1	04/13/17 12:56	04/14/17 21:15	156-59-2	
cis-1,3-Dichloropropene	<79.2	ug/kg	174	79.2	1	04/13/17 12:56	04/14/17 21:15	10061-01-5	
m&p-Xylene	<87.2	ug/kg	347	87.2	1	04/13/17 12:56	04/14/17 21:15	179601-23-1	
o-Xylene	<51.8	ug/kg	174	51.8	1	04/13/17 12:56	04/14/17 21:15	95-47-6	
trans-1,2-Dichloroethene	<83.7	ug/kg	174	83.7	1	04/13/17 12:56	04/14/17 21:15	156-60-5	
trans-1,3-Dichloropropene	<59.1	ug/kg	695	59.1	1	04/13/17 12:56	04/14/17 21:15	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-125		1	04/13/17 12:56	04/14/17 21:15	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1	04/13/17 12:56	04/14/17 21:15	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1	04/13/17 12:56	04/14/17 21:15	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: FD1-SS-040717**      **Lab ID: 10384673016**      Collected: 04/07/17 17:00      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>23.3</b>	%	0.10	0.10	1		04/18/17 14:22		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;47.0</b>	ug/kg	113	47.0	1	04/13/17 12:56	04/14/17 20:57	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;25.0</b>	ug/kg	113	25.0	1	04/13/17 12:56	04/14/17 20:57	79-34-5	
1,1,2-Trichloroethane	<b>&lt;24.3</b>	ug/kg	113	24.3	1	04/13/17 12:56	04/14/17 20:57	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;81.0</b>	ug/kg	450	81.0	1	04/13/17 12:56	04/14/17 20:57	76-13-1	
1,1-Dichloroethane	<b>&lt;43.7</b>	ug/kg	113	43.7	1	04/13/17 12:56	04/14/17 20:57	75-34-3	
1,1-Dichloroethene	<b>&lt;28.6</b>	ug/kg	113	28.6	1	04/13/17 12:56	04/14/17 20:57	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;34.7</b>	ug/kg	113	34.7	1	04/13/17 12:56	04/14/17 20:57	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;24.8</b>	ug/kg	113	24.8	1	04/13/17 12:56	04/14/17 20:57	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;42.3</b>	ug/kg	113	42.3	1	04/13/17 12:56	04/14/17 20:57	106-93-4	
1,2-Dichlorobenzene	<b>&lt;21.7</b>	ug/kg	113	21.7	1	04/13/17 12:56	04/14/17 20:57	95-50-1	
1,2-Dichloroethane	<b>&lt;35.6</b>	ug/kg	113	35.6	1	04/13/17 12:56	04/14/17 20:57	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;25.9</b>	ug/kg	113	25.9	1	04/13/17 12:56	04/14/17 20:57	108-67-8	
1,3-Dichlorobenzene	<b>&lt;33.1</b>	ug/kg	113	33.1	1	04/13/17 12:56	04/14/17 20:57	541-73-1	
1,4-Dichlorobenzene	<b>&lt;32.6</b>	ug/kg	113	32.6	1	04/13/17 12:56	04/14/17 20:57	106-46-7	
2-Butanone (MEK)	<b>&lt;149</b>	ug/kg	563	149	1	04/13/17 12:56	04/14/17 20:57	78-93-3	
2-Hexanone	<b>&lt;133</b>	ug/kg	563	133	1	04/13/17 12:56	04/14/17 20:57	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;74.5</b>	ug/kg	563	74.5	1	04/13/17 12:56	04/14/17 20:57	108-10-1	
Acetone	<b>&lt;738</b>	ug/kg	2250	738	1	04/13/17 12:56	04/14/17 20:57	67-64-1	
Benzene	<b>&lt;9.7</b>	ug/kg	45.0	9.7	1	04/13/17 12:56	04/14/17 20:57	71-43-2	
Bromodichloromethane	<b>&lt;31.5</b>	ug/kg	113	31.5	1	04/13/17 12:56	04/14/17 20:57	75-27-4	
Bromoform	<b>&lt;97.0</b>	ug/kg	450	97.0	1	04/13/17 12:56	04/14/17 20:57	75-25-2	
Bromomethane	<b>&lt;114</b>	ug/kg	1130	114	1	04/13/17 12:56	04/14/17 20:57	74-83-9	
Carbon tetrachloride	<b>&lt;35.3</b>	ug/kg	113	35.3	1	04/13/17 12:56	04/14/17 20:57	56-23-5	
Chlorobenzene	<b>&lt;19.6</b>	ug/kg	113	19.6	1	04/13/17 12:56	04/14/17 20:57	108-90-7	
Chloroethane	<b>&lt;178</b>	ug/kg	1130	178	1	04/13/17 12:56	04/14/17 20:57	75-00-3	
Chloroform	<b>&lt;54.7</b>	ug/kg	113	54.7	1	04/13/17 12:56	04/14/17 20:57	67-66-3	
Chloromethane	<b>&lt;54.5</b>	ug/kg	450	54.5	1	04/13/17 12:56	04/14/17 20:57	74-87-3	
Dibromochloromethane	<b>&lt;96.5</b>	ug/kg	450	96.5	1	04/13/17 12:56	04/14/17 20:57	124-48-1	
Dichlorodifluoromethane	<b>&lt;34.4</b>	ug/kg	450	34.4	1	04/13/17 12:56	04/14/17 20:57	75-71-8	
Ethylbenzene	<b>&lt;35.8</b>	ug/kg	113	35.8	1	04/13/17 12:56	04/14/17 20:57	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;106</b>	ug/kg	563	106	1	04/13/17 12:56	04/14/17 20:57	87-68-3	
Methyl-tert-butyl ether	<b>&lt;21.1</b>	ug/kg	113	21.1	1	04/13/17 12:56	04/14/17 20:57	1634-04-4	
Methylene Chloride	<b>&lt;208</b>	ug/kg	450	208	1	04/13/17 12:56	04/14/17 20:57	75-09-2	
Naphthalene	<b>&lt;27.2</b>	ug/kg	450	27.2	1	04/13/17 12:56	04/14/17 20:57	91-20-3	
Styrene	<b>&lt;29.3</b>	ug/kg	113	29.3	1	04/13/17 12:56	04/14/17 20:57	100-42-5	
Tetrachloroethene	<b>&lt;43.0</b>	ug/kg	113	43.0	1	04/13/17 12:56	04/14/17 20:57	127-18-4	
Tetrahydrofuran	<b>&lt;558</b>	ug/kg	4500	558	1	04/13/17 12:56	04/14/17 20:57	109-99-9	
Toluene	<b>&lt;35.8</b>	ug/kg	113	35.8	1	04/13/17 12:56	04/14/17 20:57	108-88-3	
Trichloroethene	<b>&lt;32.2</b>	ug/kg	113	32.2	1	04/13/17 12:56	04/14/17 20:57	79-01-6	
Trichlorofluoromethane	<b>&lt;113</b>	ug/kg	450	113	1	04/13/17 12:56	04/14/17 20:57	75-69-4	
Vinyl acetate	<b>&lt;119</b>	ug/kg	1130	119	1	04/13/17 12:56	04/14/17 20:57	108-05-4	
Vinyl chloride	<b>&lt;14.4</b>	ug/kg	45.0	14.4	1	04/13/17 12:56	04/14/17 20:57	75-01-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample: FD1-SS-040717**      **Lab ID: 10384673016**      Collected: 04/07/17 17:00      Received: 04/12/17 11:15      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<41.9	ug/kg	113	41.9	1	04/13/17 12:56	04/14/17 20:57	156-59-2	
cis-1,3-Dichloropropene	<51.3	ug/kg	113	51.3	1	04/13/17 12:56	04/14/17 20:57	10061-01-5	
m&p-Xylene	<56.5	ug/kg	225	56.5	1	04/13/17 12:56	04/14/17 20:57	179601-23-1	
o-Xylene	<33.5	ug/kg	113	33.5	1	04/13/17 12:56	04/14/17 20:57	95-47-6	
trans-1,2-Dichloroethene	<54.2	ug/kg	113	54.2	1	04/13/17 12:56	04/14/17 20:57	156-60-5	
trans-1,3-Dichloropropene	<38.3	ug/kg	450	38.3	1	04/13/17 12:56	04/14/17 20:57	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-125		1	04/13/17 12:56	04/14/17 20:57	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1	04/13/17 12:56	04/14/17 20:57	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1	04/13/17 12:56	04/14/17 20:57	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample:** Trip Blank      **Lab ID:** 10384673017      **Collected:** 04/07/17 00:00      **Received:** 04/12/17 11:15      **Matrix:** Solid

**Results reported on a "wet-weight" basis**

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<20.9	ug/kg	50.0	20.9	1	04/14/17 13:20	04/18/17 11:17	71-55-6	
1,1,2,2-Tetrachloroethane	<11.1	ug/kg	50.0	11.1	1	04/14/17 13:20	04/18/17 11:17	79-34-5	
1,1,2-Trichloroethane	<10.8	ug/kg	50.0	10.8	1	04/14/17 13:20	04/18/17 11:17	79-00-5	
1,1,2-Trichlorotrifluoroethane	<36.0	ug/kg	200	36.0	1	04/14/17 13:20	04/18/17 11:17	76-13-1	
1,1-Dichloroethane	<19.4	ug/kg	50.0	19.4	1	04/14/17 13:20	04/18/17 11:17	75-34-3	
1,1-Dichloroethene	<12.7	ug/kg	50.0	12.7	1	04/14/17 13:20	04/18/17 11:17	75-35-4	
1,2,4-Trichlorobenzene	<15.4	ug/kg	50.0	15.4	1	04/14/17 13:20	04/18/17 11:17	120-82-1	
1,2,4-Trimethylbenzene	<11.0	ug/kg	50.0	11.0	1	04/14/17 13:20	04/18/17 11:17	95-63-6	
1,2-Dibromoethane (EDB)	<18.8	ug/kg	50.0	18.8	1	04/14/17 13:20	04/18/17 11:17	106-93-4	
1,2-Dichlorobenzene	<9.7	ug/kg	50.0	9.7	1	04/14/17 13:20	04/18/17 11:17	95-50-1	
1,2-Dichloroethane	<15.8	ug/kg	50.0	15.8	1	04/14/17 13:20	04/18/17 11:17	107-06-2	
1,3,5-Trimethylbenzene	<11.5	ug/kg	50.0	11.5	1	04/14/17 13:20	04/18/17 11:17	108-67-8	
1,3-Dichlorobenzene	<14.7	ug/kg	50.0	14.7	1	04/14/17 13:20	04/18/17 11:17	541-73-1	
1,4-Dichlorobenzene	<14.5	ug/kg	50.0	14.5	1	04/14/17 13:20	04/18/17 11:17	106-46-7	
2-Butanone (MEK)	<66.0	ug/kg	250	66.0	1	04/14/17 13:20	04/18/17 11:17	78-93-3	
2-Hexanone	<58.9	ug/kg	250	58.9	1	04/14/17 13:20	04/18/17 11:17	591-78-6	
4-Methyl-2-pentanone (MIBK)	<33.1	ug/kg	250	33.1	1	04/14/17 13:20	04/18/17 11:17	108-10-1	
Acetone	<328	ug/kg	1000	328	1	04/14/17 13:20	04/18/17 11:17	67-64-1	L3
Benzene	<4.3	ug/kg	20.0	4.3	1	04/14/17 13:20	04/18/17 11:17	71-43-2	
Bromodichloromethane	<14.0	ug/kg	50.0	14.0	1	04/14/17 13:20	04/18/17 11:17	75-27-4	
Bromoform	<43.1	ug/kg	200	43.1	1	04/14/17 13:20	04/18/17 11:17	75-25-2	
Bromomethane	<50.7	ug/kg	500	50.7	1	04/14/17 13:20	04/18/17 11:17	74-83-9	
Carbon tetrachloride	<15.7	ug/kg	50.0	15.7	1	04/14/17 13:20	04/18/17 11:17	56-23-5	
Chlorobenzene	<8.7	ug/kg	50.0	8.7	1	04/14/17 13:20	04/18/17 11:17	108-90-7	
Chloroethane	<79.0	ug/kg	500	79.0	1	04/14/17 13:20	04/18/17 11:17	75-00-3	
Chloroform	<24.3	ug/kg	50.0	24.3	1	04/14/17 13:20	04/18/17 11:17	67-66-3	
Chloromethane	<24.2	ug/kg	200	24.2	1	04/14/17 13:20	04/18/17 11:17	74-87-3	
Dibromochloromethane	<42.9	ug/kg	200	42.9	1	04/14/17 13:20	04/18/17 11:17	124-48-1	
Dichlorodifluoromethane	<15.3	ug/kg	200	15.3	1	04/14/17 13:20	04/18/17 11:17	75-71-8	
Ethylbenzene	<15.9	ug/kg	50.0	15.9	1	04/14/17 13:20	04/18/17 11:17	100-41-4	
Hexachloro-1,3-butadiene	<47.0	ug/kg	250	47.0	1	04/14/17 13:20	04/18/17 11:17	87-68-3	
Methyl-tert-butyl ether	<9.4	ug/kg	50.0	9.4	1	04/14/17 13:20	04/18/17 11:17	1634-04-4	
Methylene Chloride	<92.6	ug/kg	200	92.6	1	04/14/17 13:20	04/18/17 11:17	75-09-2	
Naphthalene	<12.1	ug/kg	200	12.1	1	04/14/17 13:20	04/18/17 11:17	91-20-3	
Styrene	<13.0	ug/kg	50.0	13.0	1	04/14/17 13:20	04/18/17 11:17	100-42-5	
Tetrachloroethene	<19.1	ug/kg	50.0	19.1	1	04/14/17 13:20	04/18/17 11:17	127-18-4	
Tetrahydrofuran	<248	ug/kg	2000	248	1	04/14/17 13:20	04/18/17 11:17	109-99-9	
Toluene	<15.9	ug/kg	50.0	15.9	1	04/14/17 13:20	04/18/17 11:17	108-88-3	
Trichloroethene	<14.3	ug/kg	50.0	14.3	1	04/14/17 13:20	04/18/17 11:17	79-01-6	
Trichlorofluoromethane	<50.2	ug/kg	200	50.2	1	04/14/17 13:20	04/18/17 11:17	75-69-4	
Vinyl acetate	<52.9	ug/kg	500	52.9	1	04/14/17 13:20	04/18/17 11:17	108-05-4	
Vinyl chloride	<6.4	ug/kg	20.0	6.4	1	04/14/17 13:20	04/18/17 11:17	75-01-4	
cis-1,2-Dichloroethene	<18.6	ug/kg	50.0	18.6	1	04/14/17 13:20	04/18/17 11:17	156-59-2	
cis-1,3-Dichloropropene	<22.8	ug/kg	50.0	22.8	1	04/14/17 13:20	04/18/17 11:17	10061-01-5	
m&p-Xylene	<25.1	ug/kg	100	25.1	1	04/14/17 13:20	04/18/17 11:17	179601-23-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

**Sample:** Trip Blank      **Lab ID:** 10384673017      Collected: 04/07/17 00:00      Received: 04/12/17 11:15      Matrix: Solid

**Results reported on a "wet-weight" basis**

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
o-Xylene	<14.9	ug/kg	50.0	14.9	1	04/14/17 13:20	04/18/17 11:17	95-47-6	
trans-1,2-Dichloroethene	<24.1	ug/kg	50.0	24.1	1	04/14/17 13:20	04/18/17 11:17	156-60-5	
trans-1,3-Dichloropropene	<17.0	ug/kg	200	17.0	1	04/14/17 13:20	04/18/17 11:17	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-125		1	04/14/17 13:20	04/18/17 11:17	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1	04/14/17 13:20	04/18/17 11:17	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1	04/14/17 13:20	04/18/17 11:17	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

QC Batch: 469144

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10384673001, 10384673002, 10384673003, 10384673004, 10384673005, 10384673006, 10384673007, 10384673008, 10384673009, 10384673010, 10384673011, 10384673012, 10384673013, 10384673014

SAMPLE DUPLICATE: 2561785

Parameter	Units	10384673011 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	26.7	26.8	0	30	

SAMPLE DUPLICATE: 2561795

Parameter	Units	10384642001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.2	19.8	7	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

QC Batch: 469163

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10384673015, 10384673016

SAMPLE DUPLICATE: 2561867

Parameter	Units	10385063003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	30.5	31.2	2	30	

SAMPLE DUPLICATE: 2561894

Parameter	Units	10385274002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	11.4	11.9	4	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

QC Batch: 468435 Analysis Method: EPA 8260B  
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level  
Associated Lab Samples: 10384673015, 10384673016

METHOD BLANK: 2558269 Matrix: Solid  
Associated Lab Samples: 10384673015, 10384673016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/kg	<20.9	50.0	20.9	04/13/17 18:50	
1,1,2,2-Tetrachloroethane	ug/kg	<11.1	50.0	11.1	04/13/17 18:50	
1,1,2-Trichloroethane	ug/kg	<10.8	50.0	10.8	04/13/17 18:50	
1,1,2-Trichlorotrifluoroethane	ug/kg	<36.0	200	36.0	04/13/17 18:50	
1,1-Dichloroethane	ug/kg	<19.4	50.0	19.4	04/13/17 18:50	
1,1-Dichloroethene	ug/kg	<12.7	50.0	12.7	04/13/17 18:50	
1,2,4-Trichlorobenzene	ug/kg	<15.4	50.0	15.4	04/13/17 18:50	
1,2,4-Trimethylbenzene	ug/kg	<11.0	50.0	11.0	04/13/17 18:50	
1,2-Dibromoethane (EDB)	ug/kg	<18.8	50.0	18.8	04/13/17 18:50	
1,2-Dichlorobenzene	ug/kg	<9.7	50.0	9.7	04/13/17 18:50	
1,2-Dichloroethane	ug/kg	<15.8	50.0	15.8	04/13/17 18:50	
1,3,5-Trimethylbenzene	ug/kg	<11.5	50.0	11.5	04/13/17 18:50	
1,3-Dichlorobenzene	ug/kg	<14.7	50.0	14.7	04/13/17 18:50	
1,4-Dichlorobenzene	ug/kg	<14.5	50.0	14.5	04/13/17 18:50	
2-Butanone (MEK)	ug/kg	<66.0	250	66.0	04/13/17 18:50	
2-Hexanone	ug/kg	<58.9	250	58.9	04/13/17 18:50	
4-Methyl-2-pentanone (MIBK)	ug/kg	<33.1	250	33.1	04/13/17 18:50	
Acetone	ug/kg	<328	1000	328	04/13/17 18:50	
Benzene	ug/kg	<4.3	20.0	4.3	04/13/17 18:50	
Bromodichloromethane	ug/kg	<14.0	50.0	14.0	04/13/17 18:50	
Bromoform	ug/kg	<43.1	200	43.1	04/13/17 18:50	
Bromomethane	ug/kg	<50.7	500	50.7	04/13/17 18:50	
Carbon tetrachloride	ug/kg	<15.7	50.0	15.7	04/13/17 18:50	
Chlorobenzene	ug/kg	<8.7	50.0	8.7	04/13/17 18:50	
Chloroethane	ug/kg	<79.0	500	79.0	04/13/17 18:50	
Chloroform	ug/kg	<24.3	50.0	24.3	04/13/17 18:50	
Chloromethane	ug/kg	<24.2	200	24.2	04/13/17 18:50	
cis-1,2-Dichloroethene	ug/kg	<18.6	50.0	18.6	04/13/17 18:50	
cis-1,3-Dichloropropene	ug/kg	<22.8	50.0	22.8	04/13/17 18:50	
Dibromochloromethane	ug/kg	<42.9	200	42.9	04/13/17 18:50	
Dichlorodifluoromethane	ug/kg	<15.3	200	15.3	04/13/17 18:50	
Ethylbenzene	ug/kg	<15.9	50.0	15.9	04/13/17 18:50	
Hexachloro-1,3-butadiene	ug/kg	<47.0	250	47.0	04/13/17 18:50	
m&p-Xylene	ug/kg	<25.1	100	25.1	04/13/17 18:50	
Methyl-tert-butyl ether	ug/kg	<9.4	50.0	9.4	04/13/17 18:50	
Methylene Chloride	ug/kg	<92.6	200	92.6	04/13/17 18:50	
Naphthalene	ug/kg	<12.1	200	12.1	04/13/17 18:50	
o-Xylene	ug/kg	<14.9	50.0	14.9	04/13/17 18:50	
Styrene	ug/kg	<13.0	50.0	13.0	04/13/17 18:50	
Tetrachloroethene	ug/kg	<19.1	50.0	19.1	04/13/17 18:50	
Tetrahydrofuran	ug/kg	<248	2000	248	04/13/17 18:50	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

METHOD BLANK: 2558269 Matrix: Solid

Associated Lab Samples: 10384673015, 10384673016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Toluene	ug/kg	<15.9	50.0	15.9	04/13/17 18:50	
trans-1,2-Dichloroethene	ug/kg	<24.1	50.0	24.1	04/13/17 18:50	
trans-1,3-Dichloropropene	ug/kg	<17.0	200	17.0	04/13/17 18:50	
Trichloroethene	ug/kg	<14.3	50.0	14.3	04/13/17 18:50	
Trichlorofluoromethane	ug/kg	<50.2	200	50.2	04/13/17 18:50	
Vinyl acetate	ug/kg	<52.9	500	52.9	04/13/17 18:50	
Vinyl chloride	ug/kg	<6.4	20.0	6.4	04/13/17 18:50	
1,2-Dichloroethane-d4 (S)	%	109	75-125		04/13/17 18:50	
4-Bromofluorobenzene (S)	%	97	75-125		04/13/17 18:50	
Toluene-d8 (S)	%	97	75-125		04/13/17 18:50	

LABORATORY CONTROL SAMPLE & LCSD: 2558270 2558271

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	1000	1010	1100	101	110	55-125	8	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	715	763	72	76	66-125	6	20	
1,1,2-Trichloroethane	ug/kg	1000	882	934	88	93	65-125	6	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	1010	1140	101	114	57-125	12	20	
1,1-Dichloroethane	ug/kg	1000	843	900	84	90	60-125	6	20	
1,1-Dichloroethene	ug/kg	1000	981	1060	98	106	56-125	8	20	
1,2,4-Trichlorobenzene	ug/kg	1000	764	894	76	89	61-125	16	20	
1,2,4-Trimethylbenzene	ug/kg	1000	882	962	88	96	66-125	9	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	882	933	88	93	68-125	6	20	
1,2-Dichlorobenzene	ug/kg	1000	897	971	90	97	63-125	8	20	
1,2-Dichloroethane	ug/kg	1000	1040	1130	104	113	46-125	8	20	
1,3,5-Trimethylbenzene	ug/kg	1000	895	944	89	94	66-125	5	20	
1,3-Dichlorobenzene	ug/kg	1000	887	936	89	94	64-125	5	20	
1,4-Dichlorobenzene	ug/kg	1000	882	951	88	95	64-125	7	20	
2-Butanone (MEK)	ug/kg	5000	4150	4230	83	85	48-138	2	20	
2-Hexanone	ug/kg	5000	4120	4450	82	89	53-137	8	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4290	4550	86	91	54-141	6	20	
Acetone	ug/kg	5000	4220	5240	84	105	68-125	22	20	R1
Benzene	ug/kg	1000	903	954	90	95	61-125	5	20	
Bromodichloromethane	ug/kg	1000	889	944	89	94	55-125	6	20	
Bromoform	ug/kg	1000	721	790	72	79	37-125	9	20	
Bromomethane	ug/kg	1000	946	998	95	100	47-125	5	20	
Carbon tetrachloride	ug/kg	1000	956	1080	96	108	51-125	12	20	
Chlorobenzene	ug/kg	1000	928	991	93	99	63-125	7	20	
Chloroethane	ug/kg	1000	1120	1130	112	113	30-150	1	20	
Chloroform	ug/kg	1000	908	954	91	95	57-125	5	20	
Chloromethane	ug/kg	1000	686	744	69	74	45-125	8	20	
cis-1,2-Dichloroethene	ug/kg	1000	897	945	90	95	62-125	5	20	
cis-1,3-Dichloropropene	ug/kg	1000	809	869	81	87	59-125	7	20	
Dibromochloromethane	ug/kg	1000	878	921	88	92	51-125	5	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

LABORATORY CONTROL SAMPLE & LCSD: 2558270		2558271								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/kg	1000	722	783	72	78	30-125	8	20	
Ethylbenzene	ug/kg	1000	892	938	89	94	65-125	5	20	
Hexachloro-1,3-butadiene	ug/kg	1000	810	868	81	87	58-125	7	20	
m&p-Xylene	ug/kg	2000	1760	1890	88	94	67-125	7	20	
Methyl-tert-butyl ether	ug/kg	1000	890	976	89	98	60-125	9	20	
Methylene Chloride	ug/kg	1000	836	886	84	89	57-125	6	20	
Naphthalene	ug/kg	1000	773	839	77	84	61-125	8	20	
o-Xylene	ug/kg	1000	878	931	88	93	66-125	6	20	
Styrene	ug/kg	1000	932	970	93	97	66-125	4	20	
Tetrachloroethene	ug/kg	1000	1010	1080	101	108	65-125	7	20	
Tetrahydrofuran	ug/kg	10000	9660	9760	97	98	68-125	1	20	
Toluene	ug/kg	1000	840	902	84	90	67-125	7	20	
trans-1,2-Dichloroethene	ug/kg	1000	974	1000	97	100	56-125	3	20	
trans-1,3-Dichloropropene	ug/kg	1000	831	893	83	89	63-125	7	20	
Trichloroethene	ug/kg	1000	1020	1090	102	109	63-125	7	20	
Trichlorofluoromethane	ug/kg	1000	1250	1390	125	139	35-141	10	20	CH
Vinyl acetate	ug/kg	1000	788	842	79	84	50-125	7	20	
Vinyl chloride	ug/kg	1000	870	937	87	94	53-125	7	20	
1,2-Dichloroethane-d4 (S)	%				111	114	75-125			
4-Bromofluorobenzene (S)	%				95	94	75-125			
Toluene-d8 (S)	%				95	95	75-125			

MATRIX SPIKE SAMPLE: 2558272		10384733001					
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/kg	ND	1100	1120	103	56-150	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1100	657	60	61-150	M1
1,1,2-Trichloroethane	ug/kg	ND	1100	896	82	63-149	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1100	1160	106	38-150	
1,1-Dichloroethane	ug/kg	ND	1100	910	83	57-150	
1,1-Dichloroethene	ug/kg	ND	1100	1090	100	47-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1100	843	77	54-150	
1,2,4-Trimethylbenzene	ug/kg	ND	1100	941	84	55-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1100	976	89	60-149	
1,2-Dichlorobenzene	ug/kg	ND	1100	917	84	61-148	
1,2-Dichloroethane	ug/kg	ND	1100	1100	101	51-143	
1,3,5-Trimethylbenzene	ug/kg	ND	1100	921	80	61-150	
1,3-Dichlorobenzene	ug/kg	ND	1100	913	84	57-150	
1,4-Dichlorobenzene	ug/kg	ND	1100	920	84	58-148	
2-Butanone (MEK)	ug/kg	ND	5470	5120	94	55-150	
2-Hexanone	ug/kg	ND	5470	5170	95	60-150	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5470	4750	87	61-150	
Acetone	ug/kg	ND	5470	7290	133	58-150	
Benzene	ug/kg	ND	1100	977	89	54-150	
Bromodichloromethane	ug/kg	ND	1100	980	90	54-149	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

MATRIX SPIKE SAMPLE: 2558272		10384733001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromoform	ug/kg	ND	1100	782	72	47-143	
Bromomethane	ug/kg	ND	1100	915	84	36-135	
Carbon tetrachloride	ug/kg	ND	1100	1050	96	51-150	
Chlorobenzene	ug/kg	ND	1100	993	91	58-150	
Chloroethane	ug/kg	ND	1100	994	91	30-150	
Chloroform	ug/kg	ND	1100	963	88	56-145	
Chloromethane	ug/kg	ND	1100	638	58	30-131	
cis-1,2-Dichloroethene	ug/kg	ND	1100	954	87	59-150	
cis-1,3-Dichloropropene	ug/kg	ND	1100	840	77	57-146	
Dibromochloromethane	ug/kg	ND	1100	932	85	58-146	
Dichlorodifluoromethane	ug/kg	ND	1100	594	54	30-125	
Ethylbenzene	ug/kg	ND	1100	973	89	58-150	
Hexachloro-1,3-butadiene	ug/kg	ND	1100	1220	112	49-150	
m&p-Xylene	ug/kg	ND	2180	1920	87	56-150	
Methyl-tert-butyl ether	ug/kg	ND	1100	984	90	60-148	
Methylene Chloride	ug/kg	ND	1100	913	84	52-146	
Naphthalene	ug/kg	ND	1100	859	66	54-150	
o-Xylene	ug/kg	ND	1100	966	88	57-150	
Styrene	ug/kg	ND	1100	1020	93	60-150	
Tetrachloroethene	ug/kg	ND	1100	1110	101	62-150	
Tetrahydrofuran	ug/kg	ND	11000	9780	90	57-149	
Toluene	ug/kg	ND	1100	937	86	60-150	
trans-1,2-Dichloroethene	ug/kg	ND	1100	996	91	55-150	
trans-1,3-Dichloropropene	ug/kg	ND	1100	895	82	60-150	
Trichloroethene	ug/kg	ND	1100	1190	109	59-150	
Trichlorofluoromethane	ug/kg	ND	1100	1290	111	30-150	CH
Vinyl acetate	ug/kg	ND	1100	239J	22	30-150	M1
Vinyl chloride	ug/kg	ND	1100	735	67	31-146	
1,2-Dichloroethane-d4 (S)	%				114	75-125	
4-Bromofluorobenzene (S)	%				92	75-125	
Toluene-d8 (S)	%				96	75-125	

SAMPLE DUPLICATE: 2558273

Parameter	Units	10384733002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1-Trichloroethane	ug/kg	ND	<25.2		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	<13.4		30	
1,1,2-Trichloroethane	ug/kg	ND	<13.0		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	<43.4		30	
1,1-Dichloroethane	ug/kg	ND	<23.4		30	
1,1-Dichloroethene	ug/kg	ND	<15.3		30	
1,2,4-Trichlorobenzene	ug/kg	ND	<18.6		30	
1,2,4-Trimethylbenzene	ug/kg	ND	<13.3		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	<22.7		30	
1,2-Dichlorobenzene	ug/kg	ND	<11.7		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

SAMPLE DUPLICATE: 2558273

Parameter	Units	10384733002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane	ug/kg	ND	<19.1		30	
1,3,5-Trimethylbenzene	ug/kg	ND	<13.9		30	
1,3-Dichlorobenzene	ug/kg	ND	<17.7		30	
1,4-Dichlorobenzene	ug/kg	ND	<17.5		30	
2-Butanone (MEK)	ug/kg	ND	<79.6		30	
2-Hexanone	ug/kg	ND	<71.1		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	<39.9		30	
Acetone	ug/kg	ND	<396		30	
Benzene	ug/kg	ND	<5.2		30	
Bromodichloromethane	ug/kg	ND	<16.9		30	
Bromoform	ug/kg	ND	<52.0		30	
Bromomethane	ug/kg	ND	<61.2		30	
Carbon tetrachloride	ug/kg	ND	<18.9		30	
Chlorobenzene	ug/kg	ND	<10.5		30	
Chloroethane	ug/kg	ND	<95.3		30	
Chloroform	ug/kg	ND	<29.3		30	
Chloromethane	ug/kg	ND	<29.2		30	
cis-1,2-Dichloroethene	ug/kg	ND	<22.4		30	
cis-1,3-Dichloropropene	ug/kg	ND	<27.5		30	
Dibromochloromethane	ug/kg	ND	<51.8		30	
Dichlorodifluoromethane	ug/kg	ND	<18.5		30	
Ethylbenzene	ug/kg	ND	<19.2		30	
Hexachloro-1,3-butadiene	ug/kg	ND	<56.7		30	
m&p-Xylene	ug/kg	ND	<30.3		30	
Methyl-tert-butyl ether	ug/kg	ND	<11.3		30	
Methylene Chloride	ug/kg	ND	<112		30	
Naphthalene	ug/kg	ND	<14.6		30	
o-Xylene	ug/kg	ND	<18.0		30	
Styrene	ug/kg	ND	<15.7		30	
Tetrachloroethene	ug/kg	ND	<23.0		30	
Tetrahydrofuran	ug/kg	ND	<299		30	
Toluene	ug/kg	ND	<19.2		30	
trans-1,2-Dichloroethene	ug/kg	ND	<29.1		30	
trans-1,3-Dichloropropene	ug/kg	ND	<20.5		30	
Trichloroethene	ug/kg	ND	<17.3		30	
Trichlorofluoromethane	ug/kg	227	217J		30	
Vinyl acetate	ug/kg	ND	<63.8		30	
Vinyl chloride	ug/kg	ND	<7.7		30	
1,2-Dichloroethane-d4 (S)	%	99	100	8		
4-Bromofluorobenzene (S)	%	98	102	10		
Toluene-d8 (S)	%	101	101	7		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

QC Batch: 468436 Analysis Method: EPA 8260B  
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level  
Associated Lab Samples: 10384673001, 10384673002, 10384673003, 10384673004, 10384673005, 10384673006, 10384673007, 10384673008, 10384673009, 10384673010, 10384673011, 10384673012, 10384673013, 10384673014

METHOD BLANK: 2558274 Matrix: Solid  
Associated Lab Samples: 10384673001, 10384673002, 10384673003, 10384673004, 10384673005, 10384673006, 10384673007, 10384673008, 10384673009, 10384673010, 10384673011, 10384673012, 10384673013, 10384673014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/kg	<20.9	50.0	20.9	04/14/17 13:11	
1,1,2,2-Tetrachloroethane	ug/kg	<11.1	50.0	11.1	04/14/17 13:11	
1,1,2-Trichloroethane	ug/kg	<10.8	50.0	10.8	04/14/17 13:11	
1,1,2-Trichlorotrifluoroethane	ug/kg	<36.0	200	36.0	04/14/17 13:11	
1,1-Dichloroethane	ug/kg	<19.4	50.0	19.4	04/14/17 13:11	
1,1-Dichloroethene	ug/kg	<12.7	50.0	12.7	04/14/17 13:11	
1,2,4-Trichlorobenzene	ug/kg	<15.4	50.0	15.4	04/14/17 13:11	
1,2,4-Trimethylbenzene	ug/kg	<11.0	50.0	11.0	04/14/17 13:11	
1,2-Dibromoethane (EDB)	ug/kg	<18.8	50.0	18.8	04/14/17 13:11	
1,2-Dichlorobenzene	ug/kg	<9.7	50.0	9.7	04/14/17 13:11	
1,2-Dichloroethane	ug/kg	<15.8	50.0	15.8	04/14/17 13:11	
1,3,5-Trimethylbenzene	ug/kg	<11.5	50.0	11.5	04/14/17 13:11	
1,3-Dichlorobenzene	ug/kg	<14.7	50.0	14.7	04/14/17 13:11	
1,4-Dichlorobenzene	ug/kg	<14.5	50.0	14.5	04/14/17 13:11	
2-Butanone (MEK)	ug/kg	<66.0	250	66.0	04/14/17 13:11	
2-Hexanone	ug/kg	<58.9	250	58.9	04/14/17 13:11	
4-Methyl-2-pentanone (MIBK)	ug/kg	<33.1	250	33.1	04/14/17 13:11	
Acetone	ug/kg	<328	1000	328	04/14/17 13:11	
Benzene	ug/kg	<4.3	20.0	4.3	04/14/17 13:11	
Bromodichloromethane	ug/kg	<14.0	50.0	14.0	04/14/17 13:11	
Bromoform	ug/kg	<43.1	200	43.1	04/14/17 13:11	
Bromomethane	ug/kg	<50.7	500	50.7	04/14/17 13:11	
Carbon tetrachloride	ug/kg	<15.7	50.0	15.7	04/14/17 13:11	
Chlorobenzene	ug/kg	<8.7	50.0	8.7	04/14/17 13:11	
Chloroethane	ug/kg	<79.0	500	79.0	04/14/17 13:11	
Chloroform	ug/kg	<24.3	50.0	24.3	04/14/17 13:11	
Chloromethane	ug/kg	<24.2	200	24.2	04/14/17 13:11	
cis-1,2-Dichloroethene	ug/kg	<18.6	50.0	18.6	04/14/17 13:11	
cis-1,3-Dichloropropene	ug/kg	<22.8	50.0	22.8	04/14/17 13:11	
Dibromochloromethane	ug/kg	<42.9	200	42.9	04/14/17 13:11	
Dichlorodifluoromethane	ug/kg	<15.3	200	15.3	04/14/17 13:11	
Ethylbenzene	ug/kg	<15.9	50.0	15.9	04/14/17 13:11	
Hexachloro-1,3-butadiene	ug/kg	<47.0	250	47.0	04/14/17 13:11	
m&p-Xylene	ug/kg	<25.1	100	25.1	04/14/17 13:11	
Methyl-tert-butyl ether	ug/kg	<9.4	50.0	9.4	04/14/17 13:11	
Methylene Chloride	ug/kg	<92.6	200	92.6	04/14/17 13:11	
Naphthalene	ug/kg	<12.1	200	12.1	04/14/17 13:11	
o-Xylene	ug/kg	<14.9	50.0	14.9	04/14/17 13:11	
Styrene	ug/kg	<13.0	50.0	13.0	04/14/17 13:11	
Tetrachloroethene	ug/kg	<19.1	50.0	19.1	04/14/17 13:11	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

METHOD BLANK: 2558274

Matrix: Solid

Associated Lab Samples: 10384673001, 10384673002, 10384673003, 10384673004, 10384673005, 10384673006, 10384673007, 10384673008, 10384673009, 10384673010, 10384673011, 10384673012, 10384673013, 10384673014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Tetrahydrofuran	ug/kg	<248	2000	248	04/14/17 13:11	
Toluene	ug/kg	<15.9	50.0	15.9	04/14/17 13:11	
trans-1,2-Dichloroethene	ug/kg	<24.1	50.0	24.1	04/14/17 13:11	
trans-1,3-Dichloropropene	ug/kg	<17.0	200	17.0	04/14/17 13:11	
Trichloroethene	ug/kg	<14.3	50.0	14.3	04/14/17 13:11	
Trichlorofluoromethane	ug/kg	<50.2	200	50.2	04/14/17 13:11	
Vinyl acetate	ug/kg	<52.9	500	52.9	04/14/17 13:11	
Vinyl chloride	ug/kg	<6.4	20.0	6.4	04/14/17 13:11	
1,2-Dichloroethane-d4 (S)	%	97	75-125		04/14/17 13:11	
4-Bromofluorobenzene (S)	%	101	75-125		04/14/17 13:11	
Toluene-d8 (S)	%	99	75-125		04/14/17 13:11	

LABORATORY CONTROL SAMPLE: 2558275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/kg	1000	897	90	55-125	
1,1,2,2-Tetrachloroethane	ug/kg	1000	917	92	66-125	
1,1,2-Trichloroethane	ug/kg	1000	953	95	65-125	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	977	98	57-125	
1,1-Dichloroethane	ug/kg	1000	870	87	60-125	
1,1-Dichloroethene	ug/kg	1000	920	92	56-125	
1,2,4-Trichlorobenzene	ug/kg	1000	840	84	61-125	
1,2,4-Trimethylbenzene	ug/kg	1000	945	95	66-125	
1,2-Dibromoethane (EDB)	ug/kg	1000	945	95	68-125	
1,2-Dichlorobenzene	ug/kg	1000	971	97	63-125	
1,2-Dichloroethane	ug/kg	1000	911	91	46-125	
1,3,5-Trimethylbenzene	ug/kg	1000	949	95	66-125	
1,3-Dichlorobenzene	ug/kg	1000	945	94	64-125	
1,4-Dichlorobenzene	ug/kg	1000	934	93	64-125	
2-Butanone (MEK)	ug/kg	5000	4990	100	48-138	
2-Hexanone	ug/kg	5000	5180	104	53-137	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	5050	101	54-141	
Acetone	ug/kg	5000	5820	116	68-125	
Benzene	ug/kg	1000	901	90	61-125	
Bromodichloromethane	ug/kg	1000	854	85	55-125	
Bromoform	ug/kg	1000	740	74	37-125	
Bromomethane	ug/kg	1000	772	77	47-125	
Carbon tetrachloride	ug/kg	1000	822	82	51-125	
Chlorobenzene	ug/kg	1000	952	95	63-125	
Chloroethane	ug/kg	1000	825	83	30-150	
Chloroform	ug/kg	1000	835	83	57-125	
Chloromethane	ug/kg	1000	820	82	45-125	
cis-1,2-Dichloroethene	ug/kg	1000	849	85	62-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

LABORATORY CONTROL SAMPLE: 2558275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,3-Dichloropropene	ug/kg	1000	867	87	59-125	
Dibromochloromethane	ug/kg	1000	868	87	51-125	
Dichlorodifluoromethane	ug/kg	1000	563	56	30-125	
Ethylbenzene	ug/kg	1000	916	92	65-125	
Hexachloro-1,3-butadiene	ug/kg	1000	851	85	58-125	
m&p-Xylene	ug/kg	2000	1830	92	67-125	
Methyl-tert-butyl ether	ug/kg	1000	871	87	60-125	
Methylene Chloride	ug/kg	1000	824	82	57-125	
Naphthalene	ug/kg	1000	806	81	61-125	
o-Xylene	ug/kg	1000	926	93	66-125	
Styrene	ug/kg	1000	968	97	66-125	
Tetrachloroethene	ug/kg	1000	1010	101	65-125	
Tetrahydrofuran	ug/kg	10000	8430	84	68-125	
Toluene	ug/kg	1000	902	90	67-125	
trans-1,2-Dichloroethene	ug/kg	1000	898	90	56-125	
trans-1,3-Dichloropropene	ug/kg	1000	881	88	63-125	
Trichloroethene	ug/kg	1000	962	96	63-125	
Trichlorofluoromethane	ug/kg	1000	911	91	35-141	
Vinyl acetate	ug/kg	1000	843	84	50-125	
Vinyl chloride	ug/kg	1000	740	74	53-125	
1,2-Dichloroethane-d4 (S)	%			100	75-125	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2558276 2558277

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10384673011 Result	Spike Conc.	Spike Conc.	Conc.								
1,1,1-Trichloroethane	ug/kg	<29.1	1340	1380	1380	1170	1150	87	84	56-150	1	30	
1,1,2,2-Tetrachloroethane	ug/kg	<15.5	1340	1380	1380	1250	1290	93	93	61-150	3	30	
1,1,2-Trichloroethane	ug/kg	<15.0	1340	1380	1380	1300	1380	97	100	63-149	6	30	
1,1,2-Trichlorotrifluoroethane	ug/kg	<50.1	1340	1380	1380	1020	941	76	68	38-150	8	30	
1,1-Dichloroethane	ug/kg	<27.0	1340	1380	1380	1110	1150	83	84	57-150	3	30	
1,1-Dichloroethene	ug/kg	<17.7	1340	1380	1380	1110	1100	83	79	47-150	1	30	
1,2,4-Trichlorobenzene	ug/kg	<21.4	1340	1380	1380	1100	1210	82	88	54-150	10	30	
1,2,4-Trimethylbenzene	ug/kg	<15.3	1340	1380	1380	1280	1340	96	97	55-150	4	30	
1,2-Dibromoethane (EDB)	ug/kg	<26.2	1340	1380	1380	1300	1380	97	100	60-149	6	30	
1,2-Dichlorobenzene	ug/kg	<13.5	1340	1380	1380	1360	1410	102	102	61-148	3	30	
1,2-Dichloroethane	ug/kg	<22.0	1340	1380	1380	1250	1210	94	87	51-143	4	30	
1,3,5-Trimethylbenzene	ug/kg	<16.0	1340	1380	1380	1300	1370	97	99	61-150	5	30	
1,3-Dichlorobenzene	ug/kg	<20.5	1340	1380	1380	1330	1350	99	98	57-150	2	30	
1,4-Dichlorobenzene	ug/kg	<20.2	1340	1380	1380	1310	1360	98	99	58-148	4	30	
2-Butanone (MEK)	ug/kg	<91.9	6690	6910	6910	6720	6870	100	100	55-150	2	30	
2-Hexanone	ug/kg	<82.0	6690	6910	6910	7560	7840	113	113	60-150	4	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2558276			2558277								
Parameter	Units	10384673011 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
4-Methyl-2-pentanone (MIBK)	ug/kg	<46.1	6690	6910	7180	7420	107	107	61-150	3	30
Acetone	ug/kg	<457	6690	6910	8250	8060	123	117	58-150	2	30
Benzene	ug/kg	<6.0	1340	1380	1200	1220	90	89	54-150	2	30
Bromodichloromethane	ug/kg	<19.5	1340	1380	1200	1170	90	85	54-149	3	30
Bromoform	ug/kg	<60.0	1340	1380	1070	1150	80	83	47-143	7	30
Bromomethane	ug/kg	<70.6	1340	1380	949	909	71	66	36-135	4	30
Carbon tetrachloride	ug/kg	<21.9	1340	1380	1110	1090	83	79	51-150	2	30
Chlorobenzene	ug/kg	<12.1	1340	1380	1330	1380	99	100	58-150	4	30
Chloroethane	ug/kg	<110	1340	1380	953	861	71	62	30-150	10	30
Chloroform	ug/kg	<33.8	1340	1380	1120	1150	84	84	56-145	3	30
Chloromethane	ug/kg	<33.7	1340	1380	885	840	66	61	30-131	5	30
cis-1,2-Dichloroethene	ug/kg	<25.9	1340	1380	1160	1210	87	88	59-150	5	30
cis-1,3-Dichloropropene	ug/kg	<31.8	1340	1380	1170	1180	88	85	57-146	0	30
Dibromochloromethane	ug/kg	<59.8	1340	1380	1200	1260	90	92	58-146	5	30
Dichlorodifluoromethane	ug/kg	<21.3	1340	1380	365	347	27	25	30-125	5	30 M1
Ethylbenzene	ug/kg	<22.1	1340	1380	1270	1320	95	96	58-150	4	30
Hexachloro-1,3-butadiene	ug/kg	<65.5	1340	1380	1240	1320	93	96	49-150	6	30
m&p-Xylene	ug/kg	<35.0	2680	2760	2510	2640	94	95	56-150	5	30
Methyl-tert-butyl ether	ug/kg	<13.0	1340	1380	1200	1240	89	90	60-148	4	30
Methylene Chloride	ug/kg	<129	1340	1380	1110	1090	83	79	52-146	1	30
Naphthalene	ug/kg	<16.9	1340	1380	1130	1220	85	88	54-150	7	30
o-Xylene	ug/kg	<20.8	1340	1380	1300	1330	97	96	57-150	2	30
Styrene	ug/kg	<18.1	1340	1380	1330	1410	100	102	60-150	5	30
Tetrachloroethene	ug/kg	<26.6	1340	1380	1400	1430	105	103	62-150	2	30
Tetrahydrofuran	ug/kg	<345	13400	13800	11600	12500	87	90	57-149	7	30
Toluene	ug/kg	<22.1	1340	1380	1230	1250	92	91	60-150	2	30
trans-1,2-Dichloroethene	ug/kg	<33.6	1340	1380	1160	1180	87	85	55-150	1	30
trans-1,3-Dichloropropene	ug/kg	<23.7	1340	1380	1190	1220	89	88	60-150	2	30
Trichloroethene	ug/kg	<19.9	1340	1380	1300	1270	97	92	59-150	2	30
Trichlorofluoromethane	ug/kg	<69.9	1340	1380	996	874	74	63	30-150	13	30
Vinyl acetate	ug/kg	<73.7	1340	1380	1140	1180	85	85	30-150	3	30
Vinyl chloride	ug/kg	<8.9	1340	1380	771	721	58	52	31-146	7	30
1,2-Dichloroethane-d4 (S)	%.						100	98	75-125		
4-Bromofluorobenzene (S)	%.						98	99	75-125		
Toluene-d8 (S)	%.						101	102	75-125		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

QC Batch: 468660 Analysis Method: EPA 8260B  
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level  
Associated Lab Samples: 10384673017

METHOD BLANK: 2559440 Matrix: Solid  
Associated Lab Samples: 10384673017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/kg	<20.9	50.0	20.9	04/15/17 16:03	
1,1,2,2-Tetrachloroethane	ug/kg	<11.1	50.0	11.1	04/15/17 16:03	
1,1,2-Trichloroethane	ug/kg	<10.8	50.0	10.8	04/15/17 16:03	
1,1,2-Trichlorotrifluoroethane	ug/kg	<36.0	200	36.0	04/15/17 16:03	
1,1-Dichloroethane	ug/kg	<19.4	50.0	19.4	04/15/17 16:03	
1,1-Dichloroethene	ug/kg	<12.7	50.0	12.7	04/15/17 16:03	
1,2,4-Trichlorobenzene	ug/kg	<15.4	50.0	15.4	04/15/17 16:03	
1,2,4-Trimethylbenzene	ug/kg	<11.0	50.0	11.0	04/15/17 16:03	
1,2-Dibromoethane (EDB)	ug/kg	<18.8	50.0	18.8	04/15/17 16:03	
1,2-Dichlorobenzene	ug/kg	<9.7	50.0	9.7	04/15/17 16:03	
1,2-Dichloroethane	ug/kg	<15.8	50.0	15.8	04/15/17 16:03	
1,3,5-Trimethylbenzene	ug/kg	<11.5	50.0	11.5	04/15/17 16:03	
1,3-Dichlorobenzene	ug/kg	<14.7	50.0	14.7	04/15/17 16:03	
1,4-Dichlorobenzene	ug/kg	<14.5	50.0	14.5	04/15/17 16:03	
2-Butanone (MEK)	ug/kg	<66.0	250	66.0	04/15/17 16:03	
2-Hexanone	ug/kg	<58.9	250	58.9	04/15/17 16:03	
4-Methyl-2-pentanone (MIBK)	ug/kg	<33.1	250	33.1	04/15/17 16:03	
Acetone	ug/kg	<328	1000	328	04/15/17 16:03	
Benzene	ug/kg	<4.3	20.0	4.3	04/15/17 16:03	
Bromodichloromethane	ug/kg	<14.0	50.0	14.0	04/15/17 16:03	
Bromoform	ug/kg	<43.1	200	43.1	04/15/17 16:03	
Bromomethane	ug/kg	<50.7	500	50.7	04/15/17 16:03	
Carbon tetrachloride	ug/kg	<15.7	50.0	15.7	04/15/17 16:03	
Chlorobenzene	ug/kg	<8.7	50.0	8.7	04/15/17 16:03	
Chloroethane	ug/kg	<79.0	500	79.0	04/15/17 16:03	
Chloroform	ug/kg	<24.3	50.0	24.3	04/15/17 16:03	
Chloromethane	ug/kg	<24.2	200	24.2	04/15/17 16:03	
cis-1,2-Dichloroethene	ug/kg	<18.6	50.0	18.6	04/15/17 16:03	
cis-1,3-Dichloropropene	ug/kg	<22.8	50.0	22.8	04/15/17 16:03	
Dibromochloromethane	ug/kg	<42.9	200	42.9	04/15/17 16:03	
Dichlorodifluoromethane	ug/kg	<15.3	200	15.3	04/15/17 16:03	
Ethylbenzene	ug/kg	<15.9	50.0	15.9	04/15/17 16:03	
Hexachloro-1,3-butadiene	ug/kg	<47.0	250	47.0	04/15/17 16:03	
m&p-Xylene	ug/kg	<25.1	100	25.1	04/15/17 16:03	
Methyl-tert-butyl ether	ug/kg	<9.4	50.0	9.4	04/15/17 16:03	
Methylene Chloride	ug/kg	<92.6	200	92.6	04/15/17 16:03	
Naphthalene	ug/kg	<12.1	200	12.1	04/15/17 16:03	
o-Xylene	ug/kg	<14.9	50.0	14.9	04/15/17 16:03	
Styrene	ug/kg	<13.0	50.0	13.0	04/15/17 16:03	
Tetrachloroethene	ug/kg	<19.1	50.0	19.1	04/15/17 16:03	
Tetrahydrofuran	ug/kg	<248	2000	248	04/15/17 16:03	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

METHOD BLANK: 2559440

Matrix: Solid

Associated Lab Samples: 10384673017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Toluene	ug/kg	<15.9	50.0	15.9	04/15/17 16:03	
trans-1,2-Dichloroethene	ug/kg	<24.1	50.0	24.1	04/15/17 16:03	
trans-1,3-Dichloropropene	ug/kg	<17.0	200	17.0	04/15/17 16:03	
Trichloroethene	ug/kg	<14.3	50.0	14.3	04/15/17 16:03	
Trichlorofluoromethane	ug/kg	<50.2	200	50.2	04/15/17 16:03	
Vinyl acetate	ug/kg	<52.9	500	52.9	04/15/17 16:03	
Vinyl chloride	ug/kg	<6.4	20.0	6.4	04/15/17 16:03	
1,2-Dichloroethane-d4 (S)	%	101	75-125		04/15/17 16:03	
4-Bromofluorobenzene (S)	%	101	75-125		04/15/17 16:03	
Toluene-d8 (S)	%	101	75-125		04/15/17 16:03	

LABORATORY CONTROL SAMPLE & LCSD: 2559441

2559442

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	1000	940	1010	94	101	55-125	7	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	956	1010	96	101	66-125	6	20	
1,1,2-Trichloroethane	ug/kg	1000	961	1030	96	103	65-125	7	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	1030	1100	103	110	57-125	6	20	
1,1-Dichloroethane	ug/kg	1000	970	1020	97	102	60-125	5	20	
1,1-Dichloroethene	ug/kg	1000	972	1050	97	105	56-125	8	20	
1,2,4-Trichlorobenzene	ug/kg	1000	844	929	84	93	61-125	10	20	
1,2,4-Trimethylbenzene	ug/kg	1000	958	1040	96	104	66-125	8	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	973	1020	97	102	68-125	5	20	
1,2-Dichlorobenzene	ug/kg	1000	984	1060	98	106	63-125	7	20	
1,2-Dichloroethane	ug/kg	1000	970	1050	97	105	46-125	8	20	
1,3,5-Trimethylbenzene	ug/kg	1000	953	1030	95	103	66-125	8	20	
1,3-Dichlorobenzene	ug/kg	1000	951	1030	95	103	64-125	8	20	
1,4-Dichlorobenzene	ug/kg	1000	945	1030	94	103	64-125	8	20	
2-Butanone (MEK)	ug/kg	5000	6290	6210	126	124	48-138	1	20	
2-Hexanone	ug/kg	5000	6120	6300	122	126	53-137	3	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	5880	6300	118	126	54-141	7	20	
Acetone	ug/kg	5000	6490	5340	130	107	68-125	19	20	L1
Benzene	ug/kg	1000	993	1070	99	107	61-125	7	20	
Bromodichloromethane	ug/kg	1000	880	923	88	92	55-125	5	20	
Bromoform	ug/kg	1000	751	805	75	80	37-125	7	20	
Bromomethane	ug/kg	1000	907	948	91	95	47-125	4	20	
Carbon tetrachloride	ug/kg	1000	883	925	88	93	51-125	5	20	
Chlorobenzene	ug/kg	1000	972	1040	97	104	63-125	7	20	
Chloroethane	ug/kg	1000	801	837	80	84	30-150	4	20	
Chloroform	ug/kg	1000	888	948	89	95	57-125	7	20	
Chloromethane	ug/kg	1000	900	958	90	96	45-125	6	20	
cis-1,2-Dichloroethene	ug/kg	1000	931	986	93	99	62-125	6	20	
cis-1,3-Dichloropropene	ug/kg	1000	882	946	88	95	59-125	7	20	
Dibromochloromethane	ug/kg	1000	873	937	87	94	51-125	7	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

LABORATORY CONTROL SAMPLE & LCSD: 2559441

2559442

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/kg	1000	685	706	69	71	30-125	3	20	
Ethylbenzene	ug/kg	1000	968	1010	97	101	65-125	4	20	
Hexachloro-1,3-butadiene	ug/kg	1000	889	999	89	100	58-125	12	20	
m&p-Xylene	ug/kg	2000	1880	2010	94	100	67-125	7	20	
Methyl-tert-butyl ether	ug/kg	1000	955	1030	96	103	60-125	8	20	
Methylene Chloride	ug/kg	1000	962	994	96	99	57-125	3	20	
Naphthalene	ug/kg	1000	803	877	80	88	61-125	9	20	
o-Xylene	ug/kg	1000	938	1010	94	101	66-125	7	20	
Styrene	ug/kg	1000	978	1050	98	105	66-125	8	20	
Tetrachloroethene	ug/kg	1000	1050	1120	105	112	65-125	7	20	
Tetrahydrofuran	ug/kg	10000	8020	9040	80	90	68-125	12	20	
Toluene	ug/kg	1000	932	973	93	97	67-125	4	20	
trans-1,2-Dichloroethene	ug/kg	1000	993	1090	99	109	56-125	10	20	
trans-1,3-Dichloropropene	ug/kg	1000	902	947	90	95	63-125	5	20	
Trichloroethene	ug/kg	1000	953	1030	95	103	63-125	8	20	
Trichlorofluoromethane	ug/kg	1000	866	929	87	93	35-141	7	20	
Vinyl acetate	ug/kg	1000	971	1070	97	107	50-125	9	20	
Vinyl chloride	ug/kg	1000	879	904	88	90	53-125	3	20	
1,2-Dichloroethane-d4 (S)	%				104	104	75-125			
4-Bromofluorobenzene (S)	%				100	97	75-125			
Toluene-d8 (S)	%				101	99	75-125			

MATRIX SPIKE SAMPLE: 2559443

Parameter	Units	10384930001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/kg	ND	1170	1060	91	56-150	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1170	1070	91	61-150	
1,1,2-Trichloroethane	ug/kg	ND	1170	1090	93	63-149	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1170	1150	99	38-150	
1,1-Dichloroethane	ug/kg	ND	1170	1070	92	57-150	
1,1-Dichloroethene	ug/kg	ND	1170	1120	96	47-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1170	943	81	54-150	
1,2,4-Trimethylbenzene	ug/kg	ND	1170	1060	90	55-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1170	1080	92	60-149	
1,2-Dichlorobenzene	ug/kg	ND	1170	1090	93	61-148	
1,2-Dichloroethane	ug/kg	ND	1170	1070	91	51-143	
1,3,5-Trimethylbenzene	ug/kg	ND	1170	1070	91	61-150	
1,3-Dichlorobenzene	ug/kg	ND	1170	1050	90	57-150	
1,4-Dichlorobenzene	ug/kg	ND	1170	1070	92	58-148	
2-Butanone (MEK)	ug/kg	ND	5860	6490	111	55-150	
2-Hexanone	ug/kg	ND	5860	6650	114	60-150	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	5860	6590	113	61-150	
Acetone	ug/kg	ND	5860	6350	109	58-150	
Benzene	ug/kg	ND	1170	1110	95	54-150	
Bromodichloromethane	ug/kg	ND	1170	993	85	54-149	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

MATRIX SPIKE SAMPLE: 2559443		10384930001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromoform	ug/kg	ND	1170	853	73	47-143	
Bromomethane	ug/kg	ND	1170	1030	88	36-135	
Carbon tetrachloride	ug/kg	ND	1170	966	83	51-150	
Chlorobenzene	ug/kg	ND	1170	1090	93	58-150	
Chloroethane	ug/kg	ND	1170	803	69	30-150	
Chloroform	ug/kg	ND	1170	998	85	56-145	
Chloromethane	ug/kg	ND	1170	938	80	30-131	
cis-1,2-Dichloroethene	ug/kg	ND	1170	1030	88	59-150	
cis-1,3-Dichloropropene	ug/kg	ND	1170	976	83	57-146	
Dibromochloromethane	ug/kg	ND	1170	967	83	58-146	
Dichlorodifluoromethane	ug/kg	ND	1170	649	55	30-125	
Ethylbenzene	ug/kg	ND	1170	1060	91	58-150	
Hexachloro-1,3-butadiene	ug/kg	ND	1170	1010	86	49-150	
m&p-Xylene	ug/kg	ND	2340	2110	90	56-150	
Methyl-tert-butyl ether	ug/kg	ND	1170	1100	94	60-148	
Methylene Chloride	ug/kg	ND	1170	1040	88	52-146	
Naphthalene	ug/kg	ND	1170	906	77	54-150	
o-Xylene	ug/kg	ND	1170	1090	94	57-150	
Styrene	ug/kg	ND	1170	1100	94	60-150	
Tetrachloroethene	ug/kg	ND	1170	1150	98	62-150	
Tetrahydrofuran	ug/kg	ND	11700	9170	78	57-149	
Toluene	ug/kg	ND	1170	1050	89	60-150	
trans-1,2-Dichloroethene	ug/kg	ND	1170	1090	93	55-150	
trans-1,3-Dichloropropene	ug/kg	ND	1170	1000	85	60-150	
Trichloroethene	ug/kg	ND	1170	1110	90	59-150	
Trichlorofluoromethane	ug/kg	ND	1170	926	76	30-150	
Vinyl acetate	ug/kg	ND	1170	1160	99	30-150	
Vinyl chloride	ug/kg	ND	1170	889	76	31-146	
1,2-Dichloroethane-d4 (S)	%				103	75-125	
4-Bromofluorobenzene (S)	%				97	75-125	
Toluene-d8 (S)	%				101	75-125	

SAMPLE DUPLICATE: 2559444

Parameter	Units	10384930002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1-Trichloroethane	ug/kg	ND	<22.1		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	<11.7		30	
1,1,2-Trichloroethane	ug/kg	ND	<11.4		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	<38.1		30	
1,1-Dichloroethane	ug/kg	ND	<20.5		30	
1,1-Dichloroethene	ug/kg	ND	<13.4		30	
1,2,4-Trichlorobenzene	ug/kg	ND	<16.3		30	
1,2,4-Trimethylbenzene	ug/kg	ND	<11.6		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	<19.9		30	
1,2-Dichlorobenzene	ug/kg	ND	<10.2		30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384673

SAMPLE DUPLICATE: 2559444

Parameter	Units	10384930002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane	ug/kg	ND	<16.7		30	
1,3,5-Trimethylbenzene	ug/kg	ND	<12.2		30	
1,3-Dichlorobenzene	ug/kg	ND	<15.5		30	
1,4-Dichlorobenzene	ug/kg	ND	<15.3		30	
2-Butanone (MEK)	ug/kg	ND	<69.8		30	
2-Hexanone	ug/kg	ND	<62.3		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	<35.0		30	
Acetone	ug/kg	ND	<347		30	
Benzene	ug/kg	ND	<4.6		30	
Bromodichloromethane	ug/kg	ND	<14.8		30	
Bromoform	ug/kg	ND	<45.6		30	
Bromomethane	ug/kg	ND	<53.6		30	
Carbon tetrachloride	ug/kg	ND	<16.6		30	
Chlorobenzene	ug/kg	ND	<9.2		30	
Chloroethane	ug/kg	ND	<83.6		30	
Chloroform	ug/kg	ND	<25.7		30	
Chloromethane	ug/kg	ND	<25.6		30	
cis-1,2-Dichloroethene	ug/kg	ND	<19.7		30	
cis-1,3-Dichloropropene	ug/kg	ND	<24.1		30	
Dibromochloromethane	ug/kg	ND	<45.4		30	
Dichlorodifluoromethane	ug/kg	ND	<16.2		30	
Ethylbenzene	ug/kg	ND	<16.8		30	
Hexachloro-1,3-butadiene	ug/kg	ND	<49.7		30	
m&p-Xylene	ug/kg	ND	<26.5		30	
Methyl-tert-butyl ether	ug/kg	ND	<9.9		30	
Methylene Chloride	ug/kg	ND	<97.9		30	
Naphthalene	ug/kg	ND	<12.8		30	
o-Xylene	ug/kg	ND	<15.8		30	
Styrene	ug/kg	ND	<13.7		30	
Tetrachloroethene	ug/kg	ND	<20.2		30	
Tetrahydrofuran	ug/kg	ND	<262		30	
Toluene	ug/kg	ND	<16.8		30	
trans-1,2-Dichloroethene	ug/kg	ND	<25.5		30	
trans-1,3-Dichloropropene	ug/kg	ND	<18.0		30	
Trichloroethene	ug/kg	ND	<15.1		30	
Trichlorofluoromethane	ug/kg	ND	121J		30	
Vinyl acetate	ug/kg	ND	<55.9		30	
Vinyl chloride	ug/kg	ND	<6.8		30	
1,2-Dichloroethane-d4 (S)	%	100	100	5		
4-Bromofluorobenzene (S)	%	99	100	4		
Toluene-d8 (S)	%	101	101	5		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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## METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV 5030 Med Level	Solid	SW-846 8260B	SW-846 5030B

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## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384673

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10384673001	SB44-SS-05	ASTM D2974	469144		
10384673002	SB44-SS-10	ASTM D2974	469144		
10384673003	SB44-SS-15	ASTM D2974	469144		
10384673004	SB44-SS-20	ASTM D2974	469144		
10384673005	SB44-SS-25	ASTM D2974	469144		
10384673006	SB44-SS-30	ASTM D2974	469144		
10384673007	SB44-SS-35	ASTM D2974	469144		
10384673008	SB44-SS-40	ASTM D2974	469144		
10384673009	SB44-SS-45	ASTM D2974	469144		
10384673010	SB44-SS-50	ASTM D2974	469144		
10384673011	SB44-SS-55	ASTM D2974	469144		
10384673012	SB44-SS-60	ASTM D2974	469144		
10384673013	SB44-SS-65	ASTM D2974	469144		
10384673014	SB44-SS-70	ASTM D2974	469144		
10384673015	SB44-SS-73	ASTM D2974	469163		
10384673016	FD1-SS-040717	ASTM D2974	469163		
10384673001	SB44-SS-05	EPA 5035/5030B	468436	EPA 8260B	468699
10384673002	SB44-SS-10	EPA 5035/5030B	468436	EPA 8260B	468699
10384673003	SB44-SS-15	EPA 5035/5030B	468436	EPA 8260B	468699
10384673004	SB44-SS-20	EPA 5035/5030B	468436	EPA 8260B	468699
10384673005	SB44-SS-25	EPA 5035/5030B	468436	EPA 8260B	468699
10384673006	SB44-SS-30	EPA 5035/5030B	468436	EPA 8260B	468699
10384673007	SB44-SS-35	EPA 5035/5030B	468436	EPA 8260B	468699
10384673008	SB44-SS-40	EPA 5035/5030B	468436	EPA 8260B	468699
10384673009	SB44-SS-45	EPA 5035/5030B	468436	EPA 8260B	468699
10384673010	SB44-SS-50	EPA 5035/5030B	468436	EPA 8260B	468699
10384673011	SB44-SS-55	EPA 5035/5030B	468436	EPA 8260B	468699
10384673012	SB44-SS-60	EPA 5035/5030B	468436	EPA 8260B	468699
10384673013	SB44-SS-65	EPA 5035/5030B	468436	EPA 8260B	468699
10384673014	SB44-SS-70	EPA 5035/5030B	468436	EPA 8260B	468699
10384673015	SB44-SS-73	EPA 5035/5030B	468435	EPA 8260B	468625
10384673016	FD1-SS-040717	EPA 5035/5030B	468435	EPA 8260B	468625
10384673017	Trip Blank	EPA 5035/5030B	468660	EPA 8260B	468874

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

10394673

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

<b>Section A</b> Required Client Information:			<b>Section B</b> Required Project Information:			<b>Section C</b> Invoice Information:		
Company: CH2M Hill			Report To: Mark Ochsnr, Brad Ostapowicz			Attention: Gary Honeyman		
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201			Copy To: Steve Demus			Company Name: UPRR		
Email: mark.Ochsnr@ch2n.com			Purchase Order #:			Address: CAS		
Phone:		Fax:	Project Name: UPRR_Freeman			Pace Project Manager:		
Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day			Project #: 1497			Pace Profile #: 36447 / 1		

ITEM #	SAMPLE ID One Character per box. □ (A-Z, 0-9 / , -) □ Sample IDs must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	Preservatives										Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)							
				START		END			# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other										
				DATE	TIME	DATE	TIME																				
1	SB44-SS-05	SL	G			4.7.17	910		3	1																	001
2	SB44-SS-10	SL				4.7.17	920		3	1																	002
3	SB44-SS-15	SL				4.7.17	930		3	1																	003
4	SB44-SS-20	SL				4.7.17	940		3	1																	004
5	SB44-SS-25	SL				4.7.17	945		3	1																	005
6	SB44-SS-30	SL				4.7.17	1005		3	1																	006
7	SB44-SS-35	SL				4.7.17	1010		3	1																	007
8	SB44-SS-40	SL				4.7.17	1025		3	1																	008
9	SB44-SS-45	SL				4.7.17	1020		3	1																	009
10	SB44-SS-50	SL				4.7.17	1045		3	1																	010
11	SB44-SS-55	SL				4.7.17	1050		7	1																	MS/MSD OIL
12	SB44-SS-60	SL				4.7.17	1115		3	1																	012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>Steve Demus</i> / CH2M	4/10/17	1130	<i>JMS</i> / CH2M	4/10/17	1300				
	<i>JMS</i> / CH2M	4-11-17	1140	<i>Steve Demus</i> / PACE	4/12/17	11:15	114	Y	Y	Y
							36			

<b>SAMPLER NAME AND SIGNATURE</b>			
PRINT Name of SAMPLER: <i>KEVIN B. COOPER</i>		DATE Signed: 4/10/17	
SIGNATURE OF SAMPLER:			



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: **2** Of **2**

<b>Section A</b> <b>Required Client Information:</b>	<b>Section B</b> <b>Required Project Information:</b>	<b>Section C</b> <b>Invoice Information:</b>
Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapowicz	Attention: Gary Honeyman
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR
Email: mark.Ochsner@ch2n.com	Purchase Order #:	Address: CAS
Phone: [             ] Fax: [             ]	Project Name: UPRR_Freeman	Pace Quote:
Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day	Project #: 1497	Pace Project Manager:
		Pace Profile #: 39447 / 1

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9, -) Sample Ids must be unique	MATRIX CODE (see valid codes to left) MATRIX <input type="checkbox"/> CODE <input type="checkbox"/> Drinking Water <input type="checkbox"/> DW <input type="checkbox"/> Water <input type="checkbox"/> WT <input type="checkbox"/> Waste Water <input type="checkbox"/> WW <input type="checkbox"/> Product <input type="checkbox"/> P <input type="checkbox"/> Soil/Solid <input type="checkbox"/> SL <input type="checkbox"/> Oil <input type="checkbox"/> OL <input type="checkbox"/> Wipe <input type="checkbox"/> WP <input type="checkbox"/> Air <input type="checkbox"/> AR <input type="checkbox"/> Other <input type="checkbox"/> OT <input type="checkbox"/> Tissue <input type="checkbox"/> TS <input type="checkbox"/>	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	Preservatives									Analyses Test Y/N	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)							
				START		END			# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other		Requested Analysis Filtered (Y/N)																	
				DATE	TIME	DATE	TIME												Low Level VOCs by 8260	Multiple Cont.																
1	SB44-SS-65	SL	G			4-7-17	1120		3	1									X	X																013
2	SB44-SS-70	SL				4-7-17	1150		3	1									X	X															014	
3	SB44-SS-7B	SL				4-2-17	1155		3	1									X	X															015	
4	FDI-SS-040717	SL				4-7-17	1700		3	1									X	X															016	
5	TRIP BLANK								2										X																017	
6																																				
7																																				
8																																				
9																																				
10																																				
11																																				
12																																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>Mark Ochsner / CH2M</i>	4-10-17	1120	<i>RLS / CH2M</i>	4-10-17	1300				
	<i>RLS / CH2M</i>	4-11-17	1140	<i>DREW/CH2M / PACE</i>	4-12-17	1115	114	X	Y	Y
							36			

SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: <i>RUBEN GAZER</i> SIGNATURE OF SAMPLER:	DATE Signed: <i>4-10-17</i>
TEMP in C	Received on Ice <input type="checkbox"/> (Y/N) Custody Sealed <input type="checkbox"/> (Y/N) Cooler <input type="checkbox"/> (Y/N) Samples Intact <input type="checkbox"/> (Y/N)

**Sample Condition Upon Receipt**

Client Name: CH2M Hill Project #: WO# : 10384673



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 12.34 Cooler Temp Corrected (°C): 14.36 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 40.2 Date and Initials of Person Examining Contents: CSG 4/12/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Project Manager Review: JENNI GROSS

Date: 04/12/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers).



April 26, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

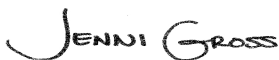
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on April 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Alaska Certification UST-107

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10384983001	MW17D-GW-041317	Water	04/13/17 12:38	04/14/17 12:20
10384983002	TRIP 1-041317	Water	04/13/17 07:00	04/14/17 12:20
10384983003	MW17D-WC-041317	Solid	04/13/17 14:40	04/14/17 12:20
10384983004	TRIP2-041317	Solid	04/13/17 08:00	04/14/17 12:20

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10384983001	MW17D-GW-041317	RSK 175	MJL	3	PASI-M
		EPA 6010C	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		EPA 8260B	DJB	83	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	JFP	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		SM 5310C	CRE	1	PASI-V
10384983002	TRIP 1-041317	EPA 8260B	DJB	83	PASI-M
10384983003	MW17D-WC-041317	EPA 6020A	RJS	7	PASI-M
		EPA 6020A	RJS	7	PASI-M
		EPA 7470A	LMW	1	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D	JLR	72	PASI-M
		EPA 8260B	MRB	51	PASI-M
10384983004	TRIP2-041317	EPA 8260B	MRB	51	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10384983001</b>	<b>MW17D-GW-041317</b>					
RSK 175	Methane	1.6J	ug/L	10.0	04/18/17 18:41	
EPA 6010C	Aluminum	17.0J	ug/L	200	04/19/17 14:35	
EPA 6010C	Barium	41.0	ug/L	10.0	04/19/17 14:35	
EPA 6010C	Calcium	29900	ug/L	500	04/19/17 14:35	
EPA 6010C	Cobalt	0.72J	ug/L	10.0	04/19/17 14:35	
EPA 6010C	Copper	3.0J	ug/L	10.0	04/19/17 14:35	
EPA 6010C	Iron	32.9J	ug/L	50.0	04/19/17 14:35	
EPA 6010C	Magnesium	13800	ug/L	500	04/19/17 14:35	
EPA 6010C	Manganese	7.8	ug/L	5.0	04/19/17 14:35	
EPA 6010C	Potassium	4510	ug/L	2500	04/19/17 14:35	
EPA 6010C	Sodium	20100	ug/L	1000	04/19/17 14:35	
EPA 6010C	Vanadium	2.8J	ug/L	15.0	04/19/17 14:35	
EPA 6010C	Zinc	7.7J	ug/L	20.0	04/19/17 14:35	
EPA 8260B	Acetone	1.7J	ug/L	20.0	04/18/17 14:38	
EPA 8260B	Toluene	0.18J	ug/L	0.50	04/18/17 14:38	
SM 2320B	Alkalinity, Total as CaCO3	149	mg/L	5.0	04/19/17 13:49	
SM 2540C	Total Dissolved Solids	220	mg/L	10.0	04/18/17 18:28	
EPA 300.0	Chloride	3.7	mg/L	1.2	04/15/17 13:50	
EPA 300.0	Nitrate as N	0.12	mg/L	0.10	04/14/17 23:36	
EPA 300.0	Sulfate	17.2	mg/L	1.2	04/15/17 13:50	
SM 5310C	Total Organic Carbon	2.1	mg/L	1.0	04/25/17 16:16	
<b>10384983002</b>	<b>TRIP 1-041317</b>					
EPA 8260B	Acetone	3.9J	ug/L	20.0	04/18/17 13:10	
EPA 8260B	Toluene	0.086J	ug/L	0.50	04/18/17 13:10	
<b>10384983003</b>	<b>MW17D-WC-041317</b>					
EPA 6020A	Arsenic	1.9	mg/kg	0.55	04/18/17 21:30	
EPA 6020A	Barium	143	mg/kg	0.33	04/18/17 21:30	M6
EPA 6020A	Cadmium	0.095	mg/kg	0.088	04/18/17 21:30	M6
EPA 6020A	Chromium	12.6	mg/kg	0.55	04/18/17 21:30	M6
EPA 6020A	Lead	5.4	mg/kg	0.11	04/18/17 21:30	M6
EPA 6020A	Selenium	3.1	mg/kg	0.55	04/18/17 21:30	
EPA 6020A	Silver	0.050J	mg/kg	0.55	04/18/17 21:30	L1,M6
EPA 6020A	Barium	0.74	mg/L	0.20	04/19/17 12:32	
EPA 7471B	Mercury	0.050	mg/kg	0.021	04/20/17 19:41	
ASTM D2974	Percent Moisture	11.8	%	0.10	04/14/17 15:09	
EPA 8270D	Di-n-octylphthalate	56.4J	ug/kg	373	04/18/17 11:58	
EPA 8270D	bis(2-Ethylhexyl)phthalate	74.5J	ug/kg	373	04/18/17 11:58	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 6010C

**Description:** 6010C MET ICP

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 6010C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 6020A

**Description:** 6020A MET ICPMS

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 6020A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 468800

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

- LCS (Lab ID: 2560599)
- Silver

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 468800

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10384983003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2560600)
  - Barium
  - Chromium
  - Silver
- MSD (Lab ID: 2560601)
  - Barium
  - Cadmium
  - Chromium

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 6020A

**Description:** 6020A MET ICPMS

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

QC Batch: 468800

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10384983003

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- Lead
- Silver

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 6020A

**Description:** 6020A MET ICPMS, TCLP

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 6020A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3020 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 469096

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

- LCS (Lab ID: 2561654)
- Silver

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, TCLP

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 7470A

**Description:** 7470A Mercury

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 7471B

**Description:** 7471B Mercury

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 7471B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 8270D

**Description:** 8270D MSSV

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 8270D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3550 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 468571

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10384777001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2559151)
  - 2,4-Dinitrophenol
  - 4,6-Dinitro-2-methylphenol
- MSD (Lab ID: 2559152)
  - 2,4-Dinitrophenol
  - 4,6-Dinitro-2-methylphenol

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 8260B

**Description:** 8260B MSV 5030 Med Level

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 468949

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

- LCS (Lab ID: 2561113)
  - Acetone

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2561114)
  - Acetone
  - Trichlorofluoromethane

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 8260B

**Description:** 8260B MSV 5030 Med Level

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

QC Batch: 468949

D6: The precision between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 2561248)
  - Chlorobenzene
  - Toluene
  - Trichloroethene
  - m&p-Xylene

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 469076

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 469214

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10384430003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2562277)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 78765

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2053323001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 333299)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 468745

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10385469001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2559966)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2559967)
  - Chloride
  - Sulfate

**Additional Comments:**

Analyte Comments:

QC Batch: 468745

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2559966)
  - Sulfate
- MSD (Lab ID: 2559967)
  - Sulfate

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** April 26, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: MW17D-GW-041317 Lab ID: 10384983001 Collected: 04/13/17 12:38 Received: 04/14/17 12:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<0.87	ug/L	10.0	0.87	1		04/18/17 18:41	74-84-0	
Ethene	<0.77	ug/L	10.0	0.77	1		04/18/17 18:41	74-85-1	
Methane	1.6J	ug/L	10.0	0.49	1		04/18/17 18:41	74-82-8	
<b>6010C MET ICP</b>		Analytical Method: EPA 6010C Preparation Method: EPA 3010							
Aluminum	17.0J	ug/L	200	13.5	1	04/19/17 10:07	04/19/17 14:35	7429-90-5	
Antimony	<2.5	ug/L	20.0	2.5	1	04/19/17 10:07	04/19/17 14:35	7440-36-0	
Arsenic	<2.5	ug/L	20.0	2.5	1	04/19/17 10:07	04/19/17 14:35	7440-38-2	
Barium	41.0	ug/L	10.0	0.20	1	04/19/17 10:07	04/19/17 14:35	7440-39-3	
Beryllium	<0.064	ug/L	5.0	0.064	1	04/19/17 10:07	04/19/17 14:35	7440-41-7	
Cadmium	<0.30	ug/L	3.0	0.30	1	04/19/17 10:07	04/19/17 14:35	7440-43-9	
Calcium	29900	ug/L	500	15.8	1	04/19/17 10:07	04/19/17 14:35	7440-70-2	
Chromium	<2.0	ug/L	10.0	2.0	1	04/19/17 10:07	04/19/17 14:35	7440-47-3	
Cobalt	0.72J	ug/L	10.0	0.51	1	04/19/17 10:07	04/19/17 14:35	7440-48-4	
Copper	3.0J	ug/L	10.0	0.89	1	04/19/17 10:07	04/19/17 14:35	7440-50-8	
Iron	32.9J	ug/L	50.0	18.0	1	04/19/17 10:07	04/19/17 14:35	7439-89-6	
Lead	<1.9	ug/L	10.0	1.9	1	04/19/17 10:07	04/19/17 14:35	7439-92-1	
Magnesium	13800	ug/L	500	7.4	1	04/19/17 10:07	04/19/17 14:35	7439-95-4	
Manganese	7.8	ug/L	5.0	0.33	1	04/19/17 10:07	04/19/17 14:35	7439-96-5	
Nickel	<1.6	ug/L	20.0	1.6	1	04/19/17 10:07	04/19/17 14:35	7440-02-0	
Potassium	4510	ug/L	2500	26.1	1	04/19/17 10:07	04/19/17 14:35	7440-09-7	
Selenium	<4.5	ug/L	20.0	4.5	1	04/19/17 10:07	04/19/17 14:35	7782-49-2	
Silver	<0.28	ug/L	10.0	0.28	1	04/19/17 10:07	04/19/17 14:35	7440-22-4	
Sodium	20100	ug/L	1000	12.0	1	04/19/17 10:07	04/19/17 14:35	7440-23-5	
Thallium	<3.8	ug/L	20.0	3.8	1	04/19/17 10:07	04/19/17 14:35	7440-28-0	
Vanadium	2.8J	ug/L	15.0	0.39	1	04/19/17 10:07	04/19/17 14:35	7440-62-2	
Zinc	7.7J	ug/L	20.0	1.4	1	04/19/17 10:07	04/19/17 14:35	7440-66-6	
<b>7470A Mercury</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	<0.031	ug/L	0.20	0.031	1	04/19/17 09:07	04/19/17 14:26	7439-97-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	1.0	0.064	1		04/18/17 14:38	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		04/18/17 14:38	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		04/18/17 14:38	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		04/18/17 14:38	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		04/18/17 14:38	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		04/18/17 14:38	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		04/18/17 14:38	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		04/18/17 14:38	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		04/18/17 14:38	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		04/18/17 14:38	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		04/18/17 14:38	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		04/18/17 14:38	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	10.0	0.60	1		04/18/17 14:38	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		04/18/17 14:38	106-93-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: MW17D-GW-041317 Lab ID: 10384983001 Collected: 04/13/17 12:38 Received: 04/14/17 12:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		04/18/17 14:38	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		04/18/17 14:38	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		04/18/17 14:38	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		04/18/17 14:38	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		04/18/17 14:38	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		04/18/17 14:38	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		04/18/17 14:38	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		04/18/17 14:38	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		04/18/17 14:38	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		04/18/17 14:38	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		04/18/17 14:38	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		04/18/17 14:38	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		04/18/17 14:38	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		04/18/17 14:38	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		04/18/17 14:38	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		04/18/17 14:38	108-10-1	
Acetone	1.7J	ug/L	20.0	0.64	1		04/18/17 14:38	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		04/18/17 14:38	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		04/18/17 14:38	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		04/18/17 14:38	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		04/18/17 14:38	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		04/18/17 14:38	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		04/18/17 14:38	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		04/18/17 14:38	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		04/18/17 14:38	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		04/18/17 14:38	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		04/18/17 14:38	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		04/18/17 14:38	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		04/18/17 14:38	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		04/18/17 14:38	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		04/18/17 14:38	74-87-3	
Dibromochloromethane	<0.048	ug/L	1.0	0.048	1		04/18/17 14:38	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		04/18/17 14:38	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		04/18/17 14:38	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		04/18/17 14:38	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		04/18/17 14:38	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		04/18/17 14:38	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		04/18/17 14:38	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		04/18/17 14:38	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		04/18/17 14:38	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		04/18/17 14:38	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		04/18/17 14:38	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		04/18/17 14:38	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		04/18/17 14:38	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		04/18/17 14:38	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		04/18/17 14:38	109-99-9	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

**Sample: MW17D-GW-041317**      **Lab ID: 10384983001**      Collected: 04/13/17 12:38      Received: 04/14/17 12:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<b>0.18J</b>	ug/L	0.50	0.059	1		04/18/17 14:38	108-88-3	
Trichloroethene	<b>&lt;0.044</b>	ug/L	0.40	0.044	1		04/18/17 14:38	79-01-6	
Trichlorofluoromethane	<b>&lt;0.055</b>	ug/L	0.50	0.055	1		04/18/17 14:38	75-69-4	
Vinyl acetate	<b>&lt;0.12</b>	ug/L	10.0	0.12	1		04/18/17 14:38	108-05-4	
Vinyl chloride	<b>&lt;0.098</b>	ug/L	0.20	0.098	1		04/18/17 14:38	75-01-4	
Xylene (Total)	<b>&lt;0.15</b>	ug/L	1.5	0.15	1		04/18/17 14:38	1330-20-7	
cis-1,2-Dichloroethene	<b>&lt;0.12</b>	ug/L	0.50	0.12	1		04/18/17 14:38	156-59-2	
cis-1,3-Dichloropropene	<b>&lt;0.069</b>	ug/L	0.50	0.069	1		04/18/17 14:38	10061-01-5	
m&p-Xylene	<b>&lt;0.11</b>	ug/L	1.0	0.11	1		04/18/17 14:38	179601-23-1	
n-Butylbenzene	<b>&lt;0.16</b>	ug/L	0.50	0.16	1		04/18/17 14:38	104-51-8	
n-Propylbenzene	<b>&lt;0.049</b>	ug/L	0.50	0.049	1		04/18/17 14:38	103-65-1	
o-Xylene	<b>&lt;0.044</b>	ug/L	0.50	0.044	1		04/18/17 14:38	95-47-6	
p-Isopropyltoluene	<b>&lt;0.064</b>	ug/L	0.50	0.064	1		04/18/17 14:38	99-87-6	
sec-Butylbenzene	<b>&lt;0.094</b>	ug/L	0.50	0.094	1		04/18/17 14:38	135-98-8	
tert-Amylmethyl ether	<b>&lt;0.073</b>	ug/L	0.50	0.073	1		04/18/17 14:38	994-05-8	
tert-Butyl Alcohol	<b>&lt;0.89</b>	ug/L	10.0	0.89	1		04/18/17 14:38	75-65-0	
tert-Butylbenzene	<b>&lt;0.051</b>	ug/L	0.50	0.051	1		04/18/17 14:38	98-06-6	
trans-1,2-Dichloroethene	<b>&lt;0.15</b>	ug/L	0.50	0.15	1		04/18/17 14:38	156-60-5	
trans-1,3-Dichloropropene	<b>&lt;0.044</b>	ug/L	1.0	0.044	1		04/18/17 14:38	10061-02-6	
trans-1,4-Dichloro-2-butene	<b>&lt;0.45</b>	ug/L	10.0	0.45	1		04/18/17 14:38	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		04/18/17 14:38	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		04/18/17 14:38	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		04/18/17 14:38	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<b>149</b>	mg/L	5.0	1.4	1		04/19/17 13:49		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>220</b>	mg/L	10.0	5.0	1		04/18/17 18:28		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<b>&lt;0.0050</b>	mg/L	0.020	0.0050	1		04/19/17 10:33	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.7</b>	mg/L	1.2	0.10	1		04/15/17 13:50	16887-00-6	
Nitrate as N	<b>0.12</b>	mg/L	0.10	0.013	1		04/14/17 23:36	14797-55-8	
Sulfate	<b>17.2</b>	mg/L	1.2	0.16	1		04/15/17 13:50	14808-79-8	
<b>5310C TOC</b>		Analytical Method: SM 5310C							
Total Organic Carbon	<b>2.1</b>	mg/L	1.0	0.24	1		04/25/17 16:16	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: TRIP 1-041317 Lab ID: 10384983002 Collected: 04/13/17 07:00 Received: 04/14/17 12:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	1.0	0.064	1		04/18/17 13:10	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		04/18/17 13:10	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		04/18/17 13:10	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		04/18/17 13:10	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		04/18/17 13:10	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		04/18/17 13:10	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		04/18/17 13:10	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		04/18/17 13:10	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		04/18/17 13:10	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		04/18/17 13:10	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		04/18/17 13:10	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		04/18/17 13:10	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	10.0	0.60	1		04/18/17 13:10	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		04/18/17 13:10	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		04/18/17 13:10	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		04/18/17 13:10	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		04/18/17 13:10	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		04/18/17 13:10	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		04/18/17 13:10	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		04/18/17 13:10	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		04/18/17 13:10	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		04/18/17 13:10	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		04/18/17 13:10	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		04/18/17 13:10	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		04/18/17 13:10	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		04/18/17 13:10	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		04/18/17 13:10	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		04/18/17 13:10	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		04/18/17 13:10	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		04/18/17 13:10	108-10-1	
Acetone	3.9J	ug/L	20.0	0.64	1		04/18/17 13:10	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		04/18/17 13:10	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		04/18/17 13:10	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		04/18/17 13:10	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		04/18/17 13:10	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		04/18/17 13:10	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		04/18/17 13:10	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		04/18/17 13:10	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		04/18/17 13:10	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		04/18/17 13:10	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		04/18/17 13:10	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		04/18/17 13:10	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		04/18/17 13:10	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		04/18/17 13:10	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		04/18/17 13:10	74-87-3	
Dibromochloromethane	<0.048	ug/L	1.0	0.048	1		04/18/17 13:10	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

**Sample: TRIP 1-041317**      **Lab ID: 10384983002**      Collected: 04/13/17 07:00      Received: 04/14/17 12:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		04/18/17 13:10	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		04/18/17 13:10	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		04/18/17 13:10	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		04/18/17 13:10	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		04/18/17 13:10	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		04/18/17 13:10	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		04/18/17 13:10	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		04/18/17 13:10	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		04/18/17 13:10	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		04/18/17 13:10	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		04/18/17 13:10	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		04/18/17 13:10	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		04/18/17 13:10	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		04/18/17 13:10	109-99-9	
Toluene	0.086J	ug/L	0.50	0.059	1		04/18/17 13:10	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		04/18/17 13:10	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		04/18/17 13:10	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		04/18/17 13:10	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		04/18/17 13:10	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		04/18/17 13:10	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		04/18/17 13:10	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		04/18/17 13:10	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		04/18/17 13:10	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		04/18/17 13:10	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		04/18/17 13:10	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		04/18/17 13:10	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		04/18/17 13:10	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		04/18/17 13:10	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		04/18/17 13:10	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		04/18/17 13:10	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		04/18/17 13:10	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		04/18/17 13:10	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		04/18/17 13:10	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		04/18/17 13:10	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		04/18/17 13:10	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		04/18/17 13:10	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		04/18/17 13:10	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: MW17D-WC-041317 Lab ID: 10384983003 Collected: 04/13/17 14:40 Received: 04/14/17 12:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>									
Analytical Method: EPA 6020A Preparation Method: EPA 3050									
Arsenic	1.9	mg/kg	0.55	0.068	20	04/18/17 06:48	04/18/17 21:30	7440-38-2	
Barium	143	mg/kg	0.33	0.047	20	04/18/17 06:48	04/18/17 21:30	7440-39-3	M6
Cadmium	0.095	mg/kg	0.088	0.016	20	04/18/17 06:48	04/18/17 21:30	7440-43-9	M6
Chromium	12.6	mg/kg	0.55	0.21	20	04/18/17 06:48	04/18/17 21:30	7440-47-3	M6
Lead	5.4	mg/kg	0.11	0.020	20	04/18/17 06:48	04/18/17 21:30	7439-92-1	M6
Selenium	3.1	mg/kg	0.55	0.085	20	04/18/17 06:48	04/18/17 21:30	7782-49-2	
Silver	0.050J	mg/kg	0.55	0.0095	20	04/18/17 06:48	04/18/17 21:30	7440-22-4	L1,M6
<b>6020A MET ICPMS, TCLP</b>									
Analytical Method: EPA 6020A Preparation Method: EPA 3020									
Leachate Method/Date: EPA 1311; 04/18/17 10:07 Initial pH: 8.22; Final pH: 1.48									
Arsenic	<0.034	mg/L	0.10	0.034	1	04/19/17 09:01	04/19/17 12:32	7440-38-2	
Barium	0.74	mg/L	0.20	0.079	1	04/19/17 09:01	04/19/17 12:32	7440-39-3	
Cadmium	<0.0011	mg/L	0.015	0.0011	1	04/19/17 09:01	04/19/17 12:32	7440-43-9	
Chromium	<0.0046	mg/L	0.050	0.0046	1	04/19/17 09:01	04/19/17 12:32	7440-47-3	
Lead	<0.0091	mg/L	0.050	0.0091	1	04/19/17 09:01	04/19/17 12:32	7439-92-1	
Selenium	<0.051	mg/L	0.12	0.051	1	04/19/17 09:01	04/19/17 12:32	7782-49-2	
Silver	<0.0050	mg/L	0.050	0.0050	1	04/19/17 09:01	04/19/17 12:32	7440-22-4	L1
<b>7470A Mercury, TCLP</b>									
Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Leachate Method/Date: EPA 1311; 04/18/17 10:07 Initial pH: 8.22; Final pH: 1.48									
Mercury	<0.094	ug/L	0.60	0.094	1	04/18/17 13:29	04/18/17 17:19	7439-97-6	
<b>7471B Mercury</b>									
Analytical Method: EPA 7471B Preparation Method: EPA 7471B									
Mercury	0.050	mg/kg	0.021	0.0055	1	04/17/17 09:39	04/20/17 19:41	7439-97-6	
<b>Dry Weight</b>									
Analytical Method: ASTM D2974									
Percent Moisture	11.8	%	0.10	0.10	1		04/14/17 15:09		
<b>8270D MSSV</b>									
Analytical Method: EPA 8270D Preparation Method: EPA 3550									
Acenaphthene	<18.8	ug/kg	373	18.8	1	04/14/17 13:12	04/18/17 11:58	83-32-9	
Acenaphthylene	<19.8	ug/kg	373	19.8	1	04/14/17 13:12	04/18/17 11:58	208-96-8	
Anthracene	<19.2	ug/kg	373	19.2	1	04/14/17 13:12	04/18/17 11:58	120-12-7	
Benzo(a)anthracene	<11.3	ug/kg	373	11.3	1	04/14/17 13:12	04/18/17 11:58	56-55-3	
Benzo(a)pyrene	<22.7	ug/kg	373	22.7	1	04/14/17 13:12	04/18/17 11:58	50-32-8	
Benzo(b)fluoranthene	<24.1	ug/kg	373	24.1	1	04/14/17 13:12	04/18/17 11:58	205-99-2	
Benzo(g,h,i)perylene	<45.2	ug/kg	373	45.2	1	04/14/17 13:12	04/18/17 11:58	191-24-2	
Benzo(k)fluoranthene	<21.5	ug/kg	373	21.5	1	04/14/17 13:12	04/18/17 11:58	207-08-9	
4-Bromophenylphenyl ether	<23.0	ug/kg	373	23.0	1	04/14/17 13:12	04/18/17 11:58	101-55-3	
Butylbenzylphthalate	<45.7	ug/kg	373	45.7	1	04/14/17 13:12	04/18/17 11:58	85-68-7	
Carbazole	<20.9	ug/kg	373	20.9	1	04/14/17 13:12	04/18/17 11:58	86-74-8	
4-Chloro-3-methylphenol	<28.1	ug/kg	373	28.1	1	04/14/17 13:12	04/18/17 11:58	59-50-7	
4-Chloroaniline	<64.8	ug/kg	373	64.8	1	04/14/17 13:12	04/18/17 11:58	106-47-8	
bis(2-Chloroethoxy)methane	<58.2	ug/kg	373	58.2	1	04/14/17 13:12	04/18/17 11:58	111-91-1	
bis(2-Chloroethyl) ether	<54.3	ug/kg	373	54.3	1	04/14/17 13:12	04/18/17 11:58	111-44-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: MW17D-WC-041317 Lab ID: 10384983003 Collected: 04/13/17 14:40 Received: 04/14/17 12:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV</b>									
Analytical Method: EPA 8270D Preparation Method: EPA 3550									
bis(2-Chloroisopropyl) ether	<60.9	ug/kg	373	60.9	1	04/14/17 13:12	04/18/17 11:58	108-60-1	
2-Chloronaphthalene	<41.2	ug/kg	373	41.2	1	04/14/17 13:12	04/18/17 11:58	91-58-7	
2-Chlorophenol	<46.8	ug/kg	373	46.8	1	04/14/17 13:12	04/18/17 11:58	95-57-8	
4-Chlorophenylphenyl ether	<21.9	ug/kg	373	21.9	1	04/14/17 13:12	04/18/17 11:58	7005-72-3	
Chrysene	<11.3	ug/kg	373	11.3	1	04/14/17 13:12	04/18/17 11:58	218-01-9	
Dibenz(a,h)anthracene	<37.2	ug/kg	373	37.2	1	04/14/17 13:12	04/18/17 11:58	53-70-3	
Dibenzofuran	<14.6	ug/kg	373	14.6	1	04/14/17 13:12	04/18/17 11:58	132-64-9	
1,2-Dichlorobenzene	<55.7	ug/kg	373	55.7	1	04/14/17 13:12	04/18/17 11:58	95-50-1	
1,3-Dichlorobenzene	<50.9	ug/kg	373	50.9	1	04/14/17 13:12	04/18/17 11:58	541-73-1	
1,4-Dichlorobenzene	<58.4	ug/kg	373	58.4	1	04/14/17 13:12	04/18/17 11:58	106-46-7	
3,3'-Dichlorobenzidine	<48.3	ug/kg	373	48.3	1	04/14/17 13:12	04/18/17 11:58	91-94-1	
2,4-Dichlorophenol	<38.6	ug/kg	373	38.6	1	04/14/17 13:12	04/18/17 11:58	120-83-2	
Diethylphthalate	<20.2	ug/kg	373	20.2	1	04/14/17 13:12	04/18/17 11:58	84-66-2	
2,4-Dimethylphenol	<54.1	ug/kg	373	54.1	1	04/14/17 13:12	04/18/17 11:58	105-67-9	
Dimethylphthalate	<20.7	ug/kg	373	20.7	1	04/14/17 13:12	04/18/17 11:58	131-11-3	
Di-n-butylphthalate	<21.7	ug/kg	373	21.7	1	04/14/17 13:12	04/18/17 11:58	84-74-2	
4,6-Dinitro-2-methylphenol	<38.9	ug/kg	1920	38.9	1	04/14/17 13:12	04/18/17 11:58	534-52-1	
2,4-Dinitrophenol	<34.9	ug/kg	373	34.9	1	04/14/17 13:12	04/18/17 11:58	51-28-5	
2,4-Dinitrotoluene	<29.0	ug/kg	373	29.0	1	04/14/17 13:12	04/18/17 11:58	121-14-2	
2,6-Dinitrotoluene	<48.5	ug/kg	373	48.5	1	04/14/17 13:12	04/18/17 11:58	606-20-2	
Di-n-octylphthalate	56.4J	ug/kg	373	43.4	1	04/14/17 13:12	04/18/17 11:58	117-84-0	
1,2-Diphenylhydrazine	<24.4	ug/kg	373	24.4	1	04/14/17 13:12	04/18/17 11:58	122-66-7	
bis(2-Ethylhexyl)phthalate	74.5J	ug/kg	373	47.6	1	04/14/17 13:12	04/18/17 11:58	117-81-7	
Fluoranthene	<21.9	ug/kg	373	21.9	1	04/14/17 13:12	04/18/17 11:58	206-44-0	
Fluorene	<11.3	ug/kg	373	11.3	1	04/14/17 13:12	04/18/17 11:58	86-73-7	
Hexachloro-1,3-butadiene	<53.0	ug/kg	373	53.0	1	04/14/17 13:12	04/18/17 11:58	87-68-3	
Hexachlorobenzene	<20.1	ug/kg	373	20.1	1	04/14/17 13:12	04/18/17 11:58	118-74-1	
Hexachloroethane	<63.4	ug/kg	373	63.4	1	04/14/17 13:12	04/18/17 11:58	67-72-1	
Indeno(1,2,3-cd)pyrene	<19.2	ug/kg	373	19.2	1	04/14/17 13:12	04/18/17 11:58	193-39-5	
Isophorone	<43.9	ug/kg	373	43.9	1	04/14/17 13:12	04/18/17 11:58	78-59-1	
1-Methylnaphthalene	<43.5	ug/kg	373	43.5	1	04/14/17 13:12	04/18/17 11:58	90-12-0	
2-Methylnaphthalene	<41.8	ug/kg	373	41.8	1	04/14/17 13:12	04/18/17 11:58	91-57-6	
2-Methylphenol(o-Cresol)	<41.8	ug/kg	373	41.8	1	04/14/17 13:12	04/18/17 11:58	95-48-7	
3&4-Methylphenol(m&p Cresol)	<44.8	ug/kg	746	44.8	1	04/14/17 13:12	04/18/17 11:58		
Naphthalene	<52.5	ug/kg	373	52.5	1	04/14/17 13:12	04/18/17 11:58	91-20-3	
2-Nitroaniline	<66.2	ug/kg	373	66.2	1	04/14/17 13:12	04/18/17 11:58	88-74-4	
3-Nitroaniline	<42.7	ug/kg	373	42.7	1	04/14/17 13:12	04/18/17 11:58	99-09-2	
4-Nitroaniline	<42.8	ug/kg	373	42.8	1	04/14/17 13:12	04/18/17 11:58	100-01-6	
Nitrobenzene	<68.1	ug/kg	373	68.1	1	04/14/17 13:12	04/18/17 11:58	98-95-3	
2-Nitrophenol	<45.3	ug/kg	373	45.3	1	04/14/17 13:12	04/18/17 11:58	88-75-5	
4-Nitrophenol	<42.1	ug/kg	373	42.1	1	04/14/17 13:12	04/18/17 11:58	100-02-7	
N-Nitrosodimethylamine	<66.3	ug/kg	373	66.3	1	04/14/17 13:12	04/18/17 11:58	62-75-9	
N-Nitroso-di-n-propylamine	<51.5	ug/kg	373	51.5	1	04/14/17 13:12	04/18/17 11:58	621-64-7	
N-Nitrosodiphenylamine	<19.7	ug/kg	373	19.7	1	04/14/17 13:12	04/18/17 11:58	86-30-6	
Pentachlorophenol	<40.0	ug/kg	757	40.0	1	04/14/17 13:12	04/18/17 11:58	87-86-5	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: MW17D-WC-041317 Lab ID: 10384983003 Collected: 04/13/17 14:40 Received: 04/14/17 12:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8270D MSSV</b>									
Analytical Method: EPA 8270D Preparation Method: EPA 3550									
Phenanthrene	<20.3	ug/kg	373	20.3	1	04/14/17 13:12	04/18/17 11:58	85-01-8	
Phenol	<48.1	ug/kg	373	48.1	1	04/14/17 13:12	04/18/17 11:58	108-95-2	
Pyrene	<11.3	ug/kg	373	11.3	1	04/14/17 13:12	04/18/17 11:58	129-00-0	
1,2,4-Trichlorobenzene	<59.8	ug/kg	373	59.8	1	04/14/17 13:12	04/18/17 11:58	120-82-1	
2,4,5-Trichlorophenol	<40.3	ug/kg	373	40.3	1	04/14/17 13:12	04/18/17 11:58	95-95-4	
2,4,6-Trichlorophenol	<19.7	ug/kg	373	19.7	1	04/14/17 13:12	04/18/17 11:58	88-06-2	
<b>Surrogates</b>									
Nitrobenzene-d5 (S)	66	%	30-125		1	04/14/17 13:12	04/18/17 11:58	4165-60-0	
2-Fluorobiphenyl (S)	68	%	30-130		1	04/14/17 13:12	04/18/17 11:58	321-60-8	
p-Terphenyl-d14 (S)	79	%	30-148		1	04/14/17 13:12	04/18/17 11:58	1718-51-0	
Phenol-d6 (S)	69	%	30-125		1	04/14/17 13:12	04/18/17 11:58	13127-88-3	
2-Fluorophenol (S)	67	%	30-125		1	04/14/17 13:12	04/18/17 11:58	367-12-4	
2,4,6-Tribromophenol (S)	78	%	30-141		1	04/14/17 13:12	04/18/17 11:58	118-79-6	
<b>8260B MSV 5030 Med Level</b>									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,1-Trichloroethane	<25.3	ug/kg	60.5	25.3	1	04/17/17 15:56	04/18/17 09:12	71-55-6	
1,1,2,2-Tetrachloroethane	<13.4	ug/kg	60.5	13.4	1	04/17/17 15:56	04/18/17 09:12	79-34-5	
1,1,2-Trichloroethane	<13.1	ug/kg	60.5	13.1	1	04/17/17 15:56	04/18/17 09:12	79-00-5	
1,1,2-Trichlorotrifluoroethane	<43.5	ug/kg	242	43.5	1	04/17/17 15:56	04/18/17 09:12	76-13-1	
1,1-Dichloroethane	<23.5	ug/kg	60.5	23.5	1	04/17/17 15:56	04/18/17 09:12	75-34-3	
1,1-Dichloroethene	<15.4	ug/kg	60.5	15.4	1	04/17/17 15:56	04/18/17 09:12	75-35-4	
1,2,4-Trichlorobenzene	<18.6	ug/kg	60.5	18.6	1	04/17/17 15:56	04/18/17 09:12	120-82-1	
1,2,4-Trimethylbenzene	<13.3	ug/kg	60.5	13.3	1	04/17/17 15:56	04/18/17 09:12	95-63-6	
1,2-Dibromoethane (EDB)	<22.7	ug/kg	60.5	22.7	1	04/17/17 15:56	04/18/17 09:12	106-93-4	
1,2-Dichlorobenzene	<11.7	ug/kg	60.5	11.7	1	04/17/17 15:56	04/18/17 09:12	95-50-1	
1,2-Dichloroethane	<19.1	ug/kg	60.5	19.1	1	04/17/17 15:56	04/18/17 09:12	107-06-2	
1,3,5-Trimethylbenzene	<13.9	ug/kg	60.5	13.9	1	04/17/17 15:56	04/18/17 09:12	108-67-8	
1,3-Dichlorobenzene	<17.8	ug/kg	60.5	17.8	1	04/17/17 15:56	04/18/17 09:12	541-73-1	
1,4-Dichlorobenzene	<17.5	ug/kg	60.5	17.5	1	04/17/17 15:56	04/18/17 09:12	106-46-7	
2-Butanone (MEK)	<79.8	ug/kg	302	79.8	1	04/17/17 15:56	04/18/17 09:12	78-93-3	
2-Hexanone	<71.2	ug/kg	302	71.2	1	04/17/17 15:56	04/18/17 09:12	591-78-6	
4-Methyl-2-pentanone (MIBK)	<40.0	ug/kg	302	40.0	1	04/17/17 15:56	04/18/17 09:12	108-10-1	
Acetone	<397	ug/kg	1210	397	1	04/17/17 15:56	04/18/17 09:12	67-64-1	L3
Benzene	<5.2	ug/kg	24.2	5.2	1	04/17/17 15:56	04/18/17 09:12	71-43-2	
Bromodichloromethane	<16.9	ug/kg	60.5	16.9	1	04/17/17 15:56	04/18/17 09:12	75-27-4	
Bromoform	<52.1	ug/kg	242	52.1	1	04/17/17 15:56	04/18/17 09:12	75-25-2	
Bromomethane	<61.3	ug/kg	605	61.3	1	04/17/17 15:56	04/18/17 09:12	74-83-9	
Carbon tetrachloride	<19.0	ug/kg	60.5	19.0	1	04/17/17 15:56	04/18/17 09:12	56-23-5	
Chlorobenzene	<10.5	ug/kg	60.5	10.5	1	04/17/17 15:56	04/18/17 09:12	108-90-7	
Chloroethane	<95.5	ug/kg	605	95.5	1	04/17/17 15:56	04/18/17 09:12	75-00-3	
Chloroform	<29.4	ug/kg	60.5	29.4	1	04/17/17 15:56	04/18/17 09:12	67-66-3	
Chloromethane	<29.3	ug/kg	242	29.3	1	04/17/17 15:56	04/18/17 09:12	74-87-3	
Dibromochloromethane	<51.9	ug/kg	242	51.9	1	04/17/17 15:56	04/18/17 09:12	124-48-1	
Dichlorodifluoromethane	<18.5	ug/kg	242	18.5	1	04/17/17 15:56	04/18/17 09:12	75-71-8	
Ethylbenzene	<19.2	ug/kg	60.5	19.2	1	04/17/17 15:56	04/18/17 09:12	100-41-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

**Sample: MW17D-WC-041317**      **Lab ID: 10384983003**      Collected: 04/13/17 14:40      Received: 04/14/17 12:20      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
Hexachloro-1,3-butadiene	<56.8	ug/kg	302	56.8	1	04/17/17 15:56	04/18/17 09:12	87-68-3	
Methyl-tert-butyl ether	<11.3	ug/kg	60.5	11.3	1	04/17/17 15:56	04/18/17 09:12	1634-04-4	
Methylene Chloride	<112	ug/kg	242	112	1	04/17/17 15:56	04/18/17 09:12	75-09-2	
Naphthalene	<14.6	ug/kg	242	14.6	1	04/17/17 15:56	04/18/17 09:12	91-20-3	
Styrene	<15.7	ug/kg	60.5	15.7	1	04/17/17 15:56	04/18/17 09:12	100-42-5	
Tetrachloroethene	<23.1	ug/kg	60.5	23.1	1	04/17/17 15:56	04/18/17 09:12	127-18-4	
Tetrahydrofuran	<300	ug/kg	2420	300	1	04/17/17 15:56	04/18/17 09:12	109-99-9	
Toluene	<19.2	ug/kg	60.5	19.2	1	04/17/17 15:56	04/18/17 09:12	108-88-3	
Trichloroethene	<17.3	ug/kg	60.5	17.3	1	04/17/17 15:56	04/18/17 09:12	79-01-6	
Trichlorofluoromethane	<60.7	ug/kg	242	60.7	1	04/17/17 15:56	04/18/17 09:12	75-69-4	
Vinyl acetate	<64.0	ug/kg	605	64.0	1	04/17/17 15:56	04/18/17 09:12	108-05-4	
Vinyl chloride	<7.8	ug/kg	24.2	7.8	1	04/17/17 15:56	04/18/17 09:12	75-01-4	
cis-1,2-Dichloroethene	<22.5	ug/kg	60.5	22.5	1	04/17/17 15:56	04/18/17 09:12	156-59-2	
cis-1,3-Dichloropropene	<27.6	ug/kg	60.5	27.6	1	04/17/17 15:56	04/18/17 09:12	10061-01-5	
m&p-Xylene	<30.4	ug/kg	121	30.4	1	04/17/17 15:56	04/18/17 09:12	179601-23-1	
o-Xylene	<18.0	ug/kg	60.5	18.0	1	04/17/17 15:56	04/18/17 09:12	95-47-6	
trans-1,2-Dichloroethene	<29.1	ug/kg	60.5	29.1	1	04/17/17 15:56	04/18/17 09:12	156-60-5	
trans-1,3-Dichloropropene	<20.6	ug/kg	242	20.6	1	04/17/17 15:56	04/18/17 09:12	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-125		1	04/17/17 15:56	04/18/17 09:12	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1	04/17/17 15:56	04/18/17 09:12	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1	04/17/17 15:56	04/18/17 09:12	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Sample: TRIP2-041317 Lab ID: 10384983004 Collected: 04/13/17 08:00 Received: 04/14/17 12:20 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>									
Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B									
1,1,1-Trichloroethane	<20.9	ug/kg	50.0	20.9	1	04/17/17 15:56	04/18/17 05:36	71-55-6	
1,1,2,2-Tetrachloroethane	<11.1	ug/kg	50.0	11.1	1	04/17/17 15:56	04/18/17 05:36	79-34-5	
1,1,2-Trichloroethane	<10.8	ug/kg	50.0	10.8	1	04/17/17 15:56	04/18/17 05:36	79-00-5	
1,1,2-Trichlorotrifluoroethane	<36.0	ug/kg	200	36.0	1	04/17/17 15:56	04/18/17 05:36	76-13-1	
1,1-Dichloroethane	<19.4	ug/kg	50.0	19.4	1	04/17/17 15:56	04/18/17 05:36	75-34-3	
1,1-Dichloroethene	<12.7	ug/kg	50.0	12.7	1	04/17/17 15:56	04/18/17 05:36	75-35-4	
1,2,4-Trichlorobenzene	<15.4	ug/kg	50.0	15.4	1	04/17/17 15:56	04/18/17 05:36	120-82-1	
1,2,4-Trimethylbenzene	<11.0	ug/kg	50.0	11.0	1	04/17/17 15:56	04/18/17 05:36	95-63-6	
1,2-Dibromoethane (EDB)	<18.8	ug/kg	50.0	18.8	1	04/17/17 15:56	04/18/17 05:36	106-93-4	
1,2-Dichlorobenzene	<9.7	ug/kg	50.0	9.7	1	04/17/17 15:56	04/18/17 05:36	95-50-1	
1,2-Dichloroethane	<15.8	ug/kg	50.0	15.8	1	04/17/17 15:56	04/18/17 05:36	107-06-2	
1,3,5-Trimethylbenzene	<11.5	ug/kg	50.0	11.5	1	04/17/17 15:56	04/18/17 05:36	108-67-8	
1,3-Dichlorobenzene	<14.7	ug/kg	50.0	14.7	1	04/17/17 15:56	04/18/17 05:36	541-73-1	
1,4-Dichlorobenzene	<14.5	ug/kg	50.0	14.5	1	04/17/17 15:56	04/18/17 05:36	106-46-7	
2-Butanone (MEK)	<66.0	ug/kg	250	66.0	1	04/17/17 15:56	04/18/17 05:36	78-93-3	
2-Hexanone	<58.9	ug/kg	250	58.9	1	04/17/17 15:56	04/18/17 05:36	591-78-6	
4-Methyl-2-pentanone (MIBK)	<33.1	ug/kg	250	33.1	1	04/17/17 15:56	04/18/17 05:36	108-10-1	
Acetone	<328	ug/kg	1000	328	1	04/17/17 15:56	04/18/17 05:36	67-64-1	L3
Benzene	<4.3	ug/kg	20.0	4.3	1	04/17/17 15:56	04/18/17 05:36	71-43-2	
Bromodichloromethane	<14.0	ug/kg	50.0	14.0	1	04/17/17 15:56	04/18/17 05:36	75-27-4	
Bromoform	<43.1	ug/kg	200	43.1	1	04/17/17 15:56	04/18/17 05:36	75-25-2	
Bromomethane	<50.7	ug/kg	500	50.7	1	04/17/17 15:56	04/18/17 05:36	74-83-9	
Carbon tetrachloride	<15.7	ug/kg	50.0	15.7	1	04/17/17 15:56	04/18/17 05:36	56-23-5	
Chlorobenzene	<8.7	ug/kg	50.0	8.7	1	04/17/17 15:56	04/18/17 05:36	108-90-7	
Chloroethane	<79.0	ug/kg	500	79.0	1	04/17/17 15:56	04/18/17 05:36	75-00-3	
Chloroform	<24.3	ug/kg	50.0	24.3	1	04/17/17 15:56	04/18/17 05:36	67-66-3	
Chloromethane	<24.2	ug/kg	200	24.2	1	04/17/17 15:56	04/18/17 05:36	74-87-3	
Dibromochloromethane	<42.9	ug/kg	200	42.9	1	04/17/17 15:56	04/18/17 05:36	124-48-1	
Dichlorodifluoromethane	<15.3	ug/kg	200	15.3	1	04/17/17 15:56	04/18/17 05:36	75-71-8	
Ethylbenzene	<15.9	ug/kg	50.0	15.9	1	04/17/17 15:56	04/18/17 05:36	100-41-4	
Hexachloro-1,3-butadiene	<47.0	ug/kg	250	47.0	1	04/17/17 15:56	04/18/17 05:36	87-68-3	
Methyl-tert-butyl ether	<9.4	ug/kg	50.0	9.4	1	04/17/17 15:56	04/18/17 05:36	1634-04-4	
Methylene Chloride	<92.6	ug/kg	200	92.6	1	04/17/17 15:56	04/18/17 05:36	75-09-2	
Naphthalene	<12.1	ug/kg	200	12.1	1	04/17/17 15:56	04/18/17 05:36	91-20-3	
Styrene	<13.0	ug/kg	50.0	13.0	1	04/17/17 15:56	04/18/17 05:36	100-42-5	
Tetrachloroethene	<19.1	ug/kg	50.0	19.1	1	04/17/17 15:56	04/18/17 05:36	127-18-4	
Tetrahydrofuran	<248	ug/kg	2000	248	1	04/17/17 15:56	04/18/17 05:36	109-99-9	
Toluene	<15.9	ug/kg	50.0	15.9	1	04/17/17 15:56	04/18/17 05:36	108-88-3	
Trichloroethene	<14.3	ug/kg	50.0	14.3	1	04/17/17 15:56	04/18/17 05:36	79-01-6	
Trichlorofluoromethane	<50.2	ug/kg	200	50.2	1	04/17/17 15:56	04/18/17 05:36	75-69-4	
Vinyl acetate	<52.9	ug/kg	500	52.9	1	04/17/17 15:56	04/18/17 05:36	108-05-4	
Vinyl chloride	<6.4	ug/kg	20.0	6.4	1	04/17/17 15:56	04/18/17 05:36	75-01-4	
cis-1,2-Dichloroethene	<18.6	ug/kg	50.0	18.6	1	04/17/17 15:56	04/18/17 05:36	156-59-2	
cis-1,3-Dichloropropene	<22.8	ug/kg	50.0	22.8	1	04/17/17 15:56	04/18/17 05:36	10061-01-5	
m&p-Xylene	<25.1	ug/kg	100	25.1	1	04/17/17 15:56	04/18/17 05:36	179601-23-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

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**Sample: TRIP2-041317**      **Lab ID: 10384983004**      Collected: 04/13/17 08:00      Received: 04/14/17 12:20      Matrix: Solid

**Results reported on a "wet-weight" basis**

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B    Preparation Method: EPA 5035/5030B							
o-Xylene	<14.9	ug/kg	50.0	14.9	1	04/17/17 15:56	04/18/17 05:36	95-47-6	
trans-1,2-Dichloroethene	<24.1	ug/kg	50.0	24.1	1	04/17/17 15:56	04/18/17 05:36	156-60-5	
trans-1,3-Dichloropropene	<17.0	ug/kg	200	17.0	1	04/17/17 15:56	04/18/17 05:36	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-125		1	04/17/17 15:56	04/18/17 05:36	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1	04/17/17 15:56	04/18/17 05:36	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1	04/17/17 15:56	04/18/17 05:36	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 469043 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10384983001

METHOD BLANK: 2561485 Matrix: Water  
Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<0.87	10.0	0.87	04/18/17 18:34	
Ethene	ug/L	<0.77	10.0	0.77	04/18/17 18:34	
Methane	ug/L	1.7J	10.0	0.49	04/18/17 18:34	

LABORATORY CONTROL SAMPLE & LCSD: 2561486

Parameter	Units	2561487		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Ethane	ug/L	114	108	95	96	85-115	1	20	
Ethene	ug/L	106	102	96	96	85-115	0	20	
Methane	ug/L	60.7	57.3	95	95	85-115	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2561488

Parameter	Units	10385199002		2561489		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Ethane	ug/L	ND	114	114	77.6	136	68	119	30-150	55	20 R1
Ethene	ug/L	ND	106	106	73.8	126	70	118	30-150	52	20 R1
Methane	ug/L	ND	60.7	60.7	47.6	83.6	65	124	30-150	55	20 R1

SAMPLE DUPLICATE: 2561490

Parameter	Units	10385199004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<0.87		20	
Ethene	ug/L	ND	<0.77		20	
Methane	ug/L	ND	2.2J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch: 469097

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury TCLP

Associated Lab Samples: 10384983003

METHOD BLANK: 2561658

Matrix: Water

Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.094	0.60	0.094	04/18/17 16:41	

LABORATORY CONTROL SAMPLE: 2561659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	15	14.3	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2561660 2561661

Parameter	Units	10384930001		2561660		2561661		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Mercury	ug/L	ND	15	15	14.6	14.4	98	96	80-120	2	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 468738 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water  
Associated Lab Samples: 10384983001

METHOD BLANK: 2559869 Matrix: Water  
Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.031	0.20	0.031	04/19/17 14:19	

LABORATORY CONTROL SAMPLE: 2559870

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2559871 2559872

Parameter	Units	10384931001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	ug/L	0.050J		5	5	5.1	5.1	102	100	80-120	1	20			

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch:	468818	Analysis Method:	EPA 7471B
QC Batch Method:	EPA 7471B	Analysis Description:	7471B Mercury Solids
Associated Lab Samples:	10384983003		

METHOD BLANK: 2560673 Matrix: Solid  
Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0049	0.019	0.0049	04/20/17 19:36	

LABORATORY CONTROL SAMPLE: 2560674

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.39	86	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2560675 2560676

Parameter	Units	10384983003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.050	.5	.49	0.61	0.56	111	105	75-125	8	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch: 468736

Analysis Method: EPA 6010C

QC Batch Method: EPA 3010

Analysis Description: 6010C Water

Associated Lab Samples: 10384983001

METHOD BLANK: 2559856

Matrix: Water

Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum	ug/L	<13.5	200	13.5	04/19/17 14:29	
Antimony	ug/L	<2.5	20.0	2.5	04/19/17 14:29	
Arsenic	ug/L	<2.5	20.0	2.5	04/19/17 14:29	
Barium	ug/L	<0.20	10.0	0.20	04/19/17 14:29	
Beryllium	ug/L	<0.064	5.0	0.064	04/19/17 14:29	
Cadmium	ug/L	<0.30	3.0	0.30	04/19/17 14:29	
Calcium	ug/L	<15.8	500	15.8	04/19/17 14:29	
Chromium	ug/L	<2.0	10.0	2.0	04/19/17 14:29	
Cobalt	ug/L	<0.51	10.0	0.51	04/19/17 14:29	
Copper	ug/L	<0.89	10.0	0.89	04/19/17 14:29	
Iron	ug/L	<18.0	50.0	18.0	04/19/17 14:29	
Lead	ug/L	<1.9	10.0	1.9	04/19/17 14:29	
Magnesium	ug/L	<7.4	500	7.4	04/19/17 14:29	
Manganese	ug/L	<0.33	5.0	0.33	04/19/17 14:29	
Nickel	ug/L	<1.6	20.0	1.6	04/19/17 14:29	
Potassium	ug/L	88.3J	2500	26.1	04/19/17 14:29	
Selenium	ug/L	<4.5	20.0	4.5	04/19/17 14:29	
Silver	ug/L	<0.28	10.0	0.28	04/19/17 14:29	
Sodium	ug/L	<12.0	1000	12.0	04/19/17 14:29	
Thallium	ug/L	<3.8	20.0	3.8	04/19/17 14:29	
Vanadium	ug/L	<0.39	15.0	0.39	04/19/17 14:29	
Zinc	ug/L	<1.4	20.0	1.4	04/19/17 14:29	

LABORATORY CONTROL SAMPLE: 2559857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	20000	21300	107	80-120	
Antimony	ug/L	1000	1000	100	80-120	
Arsenic	ug/L	1000	1020	102	80-120	
Barium	ug/L	1000	1020	102	80-120	
Beryllium	ug/L	1000	1020	102	80-120	
Cadmium	ug/L	1000	1010	101	80-120	
Calcium	ug/L	20000	19200	96	80-120	
Chromium	ug/L	1000	992	99	80-120	
Cobalt	ug/L	1000	991	99	80-120	
Copper	ug/L	1000	1000	100	80-120	
Iron	ug/L	20000	19900	100	80-120	
Lead	ug/L	1000	1010	101	80-120	
Magnesium	ug/L	20000	20200	101	80-120	
Manganese	ug/L	1000	1010	101	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

LABORATORY CONTROL SAMPLE: 2559857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	ug/L	1000	994	99	80-120	
Potassium	ug/L	20000	19800	99	80-120	
Selenium	ug/L	1000	1070	107	80-120	
Silver	ug/L	500	497	99	80-120	
Sodium	ug/L	20000	19800	99	80-120	
Thallium	ug/L	1000	994	99	80-120	
Vanadium	ug/L	1000	970	97	80-120	
Zinc	ug/L	1000	980	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2559858 2559859

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10384983001 Result	Spike Conc.	Spike Conc.	MS Result							
Aluminum	ug/L	17.0J	20000	20000	21800	21700	109	108	75-125	0	20	
Antimony	ug/L	<2.5	1000	1000	1030	1020	103	102	75-125	0	20	
Arsenic	ug/L	<2.5	1000	1000	1040	1040	104	104	75-125	0	20	
Barium	ug/L	41.0	1000	1000	1060	1060	102	102	75-125	0	20	
Beryllium	ug/L	<0.064	1000	1000	1030	1030	103	103	75-125	0	20	
Cadmium	ug/L	<0.30	1000	1000	1010	1010	101	101	75-125	1	20	
Calcium	ug/L	29900	20000	20000	49300	49100	97	96	75-125	0	20	
Chromium	ug/L	<2.0	1000	1000	998	993	100	99	75-125	1	20	
Cobalt	ug/L	0.72J	1000	1000	985	980	98	98	75-125	1	20	
Copper	ug/L	3.0J	1000	1000	1020	1020	102	101	75-125	0	20	
Iron	ug/L	32.9J	20000	20000	20200	20100	101	100	75-125	0	20	
Lead	ug/L	<1.9	1000	1000	1010	1000	100	100	75-125	0	20	
Magnesium	ug/L	13800	20000	20000	34300	34100	103	102	75-125	1	20	
Manganese	ug/L	7.8	1000	1000	1020	1010	101	100	75-125	0	20	
Nickel	ug/L	<1.6	1000	1000	986	981	99	98	75-125	0	20	
Potassium	ug/L	4510	20000	20000	24800	24700	102	101	75-125	0	20	
Selenium	ug/L	<4.5	1000	1000	1070	1060	107	106	75-125	1	20	
Silver	ug/L	<0.28	500	500	501	500	100	100	75-125	0	20	
Sodium	ug/L	20100	20000	20000	40000	40000	100	100	75-125	0	20	
Thallium	ug/L	<3.8	1000	1000	997	988	99	99	75-125	1	20	
Vanadium	ug/L	2.8J	1000	1000	980	977	98	97	75-125	0	20	
Zinc	ug/L	7.7J	1000	1000	976	969	97	96	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch: 468800

Analysis Method: EPA 6020A

QC Batch Method: EPA 3050

Analysis Description: 6020A Solids UPD4

Associated Lab Samples: 10384983003

METHOD BLANK: 2560598

Matrix: Solid

Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.061	0.50	0.061	04/18/17 21:25	
Barium	mg/kg	<0.042	0.30	0.042	04/18/17 21:25	
Cadmium	mg/kg	<0.014	0.079	0.014	04/18/17 21:25	
Chromium	mg/kg	<0.19	0.50	0.19	04/18/17 21:25	
Lead	mg/kg	<0.018	0.099	0.018	04/18/17 21:25	
Selenium	mg/kg	<0.076	0.50	0.076	04/18/17 21:25	
Silver	mg/kg	0.018J	0.50	0.0085	04/18/17 21:25	

LABORATORY CONTROL SAMPLE: 2560599

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	53.4	107	80-120	
Barium	mg/kg	50	54.7	109	80-120	
Cadmium	mg/kg	50	55.1	110	80-120	
Chromium	mg/kg	50	56.4	113	80-120	
Lead	mg/kg	50	55.1	110	80-120	
Selenium	mg/kg	50	52.3	105	80-120	
Silver	mg/kg	25	31.6	126	80-120 L1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2560600 2560601

Parameter	Units	10384983003		2560601		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Arsenic	mg/kg	1.9	52.9	53.9	61.8	65.5	113	118	80-120	6	20
Barium	mg/kg	143	52.9	53.9	153	168	19	46	80-120	9	20 M6
Cadmium	mg/kg	0.095	52.9	53.9	63.0	66.8	119	124	80-120	6	20 M6
Chromium	mg/kg	12.6	52.9	53.9	78.5	82.7	124	130	80-120	5	20 M6
Lead	mg/kg	5.4	52.9	53.9	67.0	70.5	116	121	80-120	5	20 M6
Selenium	mg/kg	3.1	52.9	53.9	63.0	64.2	113	113	80-120	2	20
Silver	mg/kg	0.050J	26.5	27	35.7	37.8	135	140	80-120	6	20 M6

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 469096 Analysis Method: EPA 6020A  
QC Batch Method: EPA 3020 Analysis Description: 6020A TCLP UPD4  
Associated Lab Samples: 10384983003

METHOD BLANK: 2561653 Matrix: Water  
Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.0068	0.020	0.0068	04/19/17 12:15	
Barium	mg/L	<0.016	0.040	0.016	04/19/17 12:15	
Cadmium	mg/L	<0.00022	0.0030	0.00022	04/19/17 12:15	
Chromium	mg/L	<0.00091	0.010	0.00091	04/19/17 12:15	
Lead	mg/L	<0.0018	0.010	0.0018	04/19/17 12:15	
Selenium	mg/L	<0.010	0.025	0.010	04/19/17 12:15	
Silver	mg/L	<0.0010	0.010	0.0010	04/19/17 12:15	

METHOD BLANK: 2560760 Matrix: Water  
Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.034	0.10	0.034	04/19/17 12:28	
Barium	mg/L	<0.079	0.20	0.079	04/19/17 12:28	
Cadmium	mg/L	<0.0011	0.015	0.0011	04/19/17 12:28	
Chromium	mg/L	<0.0046	0.050	0.0046	04/19/17 12:28	
Lead	mg/L	<0.0091	0.050	0.0091	04/19/17 12:28	
Selenium	mg/L	<0.051	0.12	0.051	04/19/17 12:28	
Silver	mg/L	<0.0050	0.050	0.0050	04/19/17 12:28	

LABORATORY CONTROL SAMPLE: 2561654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	.1	0.10	101	80-120	
Barium	mg/L	.1	0.10	103	80-120	
Cadmium	mg/L	.1	0.10	104	80-120	
Chromium	mg/L	.1	0.11	108	80-120	
Lead	mg/L	.1	0.10	104	80-120	
Selenium	mg/L	.1	0.11	106	80-120	
Silver	mg/L	.05	0.061	123	80-120 L1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2561655 2561656

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Arsenic	mg/L	<0.034	.5	.5	0.50	0.50	101	101	75-125	0	20

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Parameter	Units	2561655		2561656		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10384983003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Barium	mg/L	0.74	.5	.5	1.2	1.2	97	96	75-125	0	20		
Cadmium	mg/L	<0.0011	.5	.5	0.51	0.51	102	101	75-125	0	20		
Chromium	mg/L	<0.0046	.5	.5	0.53	0.53	105	105	75-125	0	20		
Lead	mg/L	<0.0091	.5	.5	0.51	0.51	101	102	75-125	1	20		
Selenium	mg/L	<0.051	.5	.5	0.51J	0.52J	103	105	75-125		20		
Silver	mg/L	<0.0050	.25	.25	0.29	0.30	117	118	75-125	2	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch: 468716

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10384983003

SAMPLE DUPLICATE: 2559737

Parameter	Units	10384454007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.5	20.6	0	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 468949 Analysis Method: EPA 8260B  
QC Batch Method: EPA 5035/5030B Analysis Description: 8260B MSV 5030 Med Level  
Associated Lab Samples: 10384983003, 10384983004

METHOD BLANK: 2561112 Matrix: Solid  
Associated Lab Samples: 10384983003, 10384983004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/kg	<20.9	50.0	20.9	04/17/17 22:31	
1,1,2,2-Tetrachloroethane	ug/kg	<11.1	50.0	11.1	04/17/17 22:31	
1,1,2-Trichloroethane	ug/kg	<10.8	50.0	10.8	04/17/17 22:31	
1,1,2-Trichlorotrifluoroethane	ug/kg	<36.0	200	36.0	04/17/17 22:31	
1,1-Dichloroethane	ug/kg	<19.4	50.0	19.4	04/17/17 22:31	
1,1-Dichloroethene	ug/kg	<12.7	50.0	12.7	04/17/17 22:31	
1,2,4-Trichlorobenzene	ug/kg	<15.4	50.0	15.4	04/17/17 22:31	
1,2,4-Trimethylbenzene	ug/kg	<11.0	50.0	11.0	04/17/17 22:31	
1,2-Dibromoethane (EDB)	ug/kg	<18.8	50.0	18.8	04/17/17 22:31	
1,2-Dichlorobenzene	ug/kg	<9.7	50.0	9.7	04/17/17 22:31	
1,2-Dichloroethane	ug/kg	<15.8	50.0	15.8	04/17/17 22:31	
1,3,5-Trimethylbenzene	ug/kg	<11.5	50.0	11.5	04/17/17 22:31	
1,3-Dichlorobenzene	ug/kg	<14.7	50.0	14.7	04/17/17 22:31	
1,4-Dichlorobenzene	ug/kg	<14.5	50.0	14.5	04/17/17 22:31	
2-Butanone (MEK)	ug/kg	<66.0	250	66.0	04/17/17 22:31	
2-Hexanone	ug/kg	<58.9	250	58.9	04/17/17 22:31	
4-Methyl-2-pentanone (MIBK)	ug/kg	<33.1	250	33.1	04/17/17 22:31	
Acetone	ug/kg	<328	1000	328	04/17/17 22:31	
Benzene	ug/kg	<4.3	20.0	4.3	04/17/17 22:31	
Bromodichloromethane	ug/kg	<14.0	50.0	14.0	04/17/17 22:31	
Bromoform	ug/kg	<43.1	200	43.1	04/17/17 22:31	
Bromomethane	ug/kg	<50.7	500	50.7	04/17/17 22:31	
Carbon tetrachloride	ug/kg	<15.7	50.0	15.7	04/17/17 22:31	
Chlorobenzene	ug/kg	<8.7	50.0	8.7	04/17/17 22:31	
Chloroethane	ug/kg	<79.0	500	79.0	04/17/17 22:31	
Chloroform	ug/kg	<24.3	50.0	24.3	04/17/17 22:31	
Chloromethane	ug/kg	<24.2	200	24.2	04/17/17 22:31	
cis-1,2-Dichloroethene	ug/kg	<18.6	50.0	18.6	04/17/17 22:31	
cis-1,3-Dichloropropene	ug/kg	<22.8	50.0	22.8	04/17/17 22:31	
Dibromochloromethane	ug/kg	<42.9	200	42.9	04/17/17 22:31	
Dichlorodifluoromethane	ug/kg	<15.3	200	15.3	04/17/17 22:31	
Ethylbenzene	ug/kg	<15.9	50.0	15.9	04/17/17 22:31	
Hexachloro-1,3-butadiene	ug/kg	<47.0	250	47.0	04/17/17 22:31	
m&p-Xylene	ug/kg	<25.1	100	25.1	04/17/17 22:31	
Methyl-tert-butyl ether	ug/kg	<9.4	50.0	9.4	04/17/17 22:31	
Methylene Chloride	ug/kg	<92.6	200	92.6	04/17/17 22:31	
Naphthalene	ug/kg	<12.1	200	12.1	04/17/17 22:31	
o-Xylene	ug/kg	<14.9	50.0	14.9	04/17/17 22:31	
Styrene	ug/kg	<13.0	50.0	13.0	04/17/17 22:31	
Tetrachloroethene	ug/kg	<19.1	50.0	19.1	04/17/17 22:31	
Tetrahydrofuran	ug/kg	<248	2000	248	04/17/17 22:31	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

METHOD BLANK: 2561112

Matrix: Solid

Associated Lab Samples: 10384983003, 10384983004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Toluene	ug/kg	<15.9	50.0	15.9	04/17/17 22:31	
trans-1,2-Dichloroethene	ug/kg	<24.1	50.0	24.1	04/17/17 22:31	
trans-1,3-Dichloropropene	ug/kg	<17.0	200	17.0	04/17/17 22:31	
Trichloroethene	ug/kg	<14.3	50.0	14.3	04/17/17 22:31	
Trichlorofluoromethane	ug/kg	<50.2	200	50.2	04/17/17 22:31	
Vinyl acetate	ug/kg	<52.9	500	52.9	04/17/17 22:31	
Vinyl chloride	ug/kg	<6.4	20.0	6.4	04/17/17 22:31	
1,2-Dichloroethane-d4 (S)	%	99	75-125		04/17/17 22:31	
4-Bromofluorobenzene (S)	%	101	75-125		04/17/17 22:31	
Toluene-d8 (S)	%	102	75-125		04/17/17 22:31	

LABORATORY CONTROL SAMPLE & LCSD: 2561113

2561114

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	1000	927	971	93	97	55-125	5	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	961	992	96	99	66-125	3	20	
1,1,2-Trichloroethane	ug/kg	1000	937	977	94	98	65-125	4	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	1020	1060	102	106	57-125	4	20	
1,1-Dichloroethane	ug/kg	1000	985	1030	98	103	60-125	4	20	
1,1-Dichloroethene	ug/kg	1000	988	1020	99	102	56-125	4	20	
1,2,4-Trichlorobenzene	ug/kg	1000	787	808	79	81	61-125	3	20	
1,2,4-Trimethylbenzene	ug/kg	1000	907	950	91	95	66-125	5	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	919	954	92	95	68-125	4	20	
1,2-Dichlorobenzene	ug/kg	1000	921	959	92	96	63-125	4	20	
1,2-Dichloroethane	ug/kg	1000	939	983	94	98	46-125	5	20	
1,3,5-Trimethylbenzene	ug/kg	1000	921	969	92	97	66-125	5	20	
1,3-Dichlorobenzene	ug/kg	1000	891	939	89	94	64-125	5	20	
1,4-Dichlorobenzene	ug/kg	1000	900	931	90	93	64-125	3	20	
2-Butanone (MEK)	ug/kg	5000	6370	6060	127	121	48-138	5	20	
2-Hexanone	ug/kg	5000	6540	6130	131	123	53-137	7	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	5930	6210	119	124	54-141	5	20	
Acetone	ug/kg	5000	6690	5340	134	107	68-125	22	20	L1,R1
Benzene	ug/kg	1000	1000	1020	100	102	61-125	2	20	
Bromodichloromethane	ug/kg	1000	849	877	85	88	55-125	3	20	
Bromoform	ug/kg	1000	754	793	75	79	37-125	5	20	
Bromomethane	ug/kg	1000	645	645	64	65	47-125	0	20	
Carbon tetrachloride	ug/kg	1000	824	874	82	87	51-125	6	20	
Chlorobenzene	ug/kg	1000	945	1010	95	101	63-125	6	20	
Chloroethane	ug/kg	1000	777	641	78	64	30-150	19	20	
Chloroform	ug/kg	1000	875	901	87	90	57-125	3	20	
Chloromethane	ug/kg	1000	980	833	98	83	45-125	16	20	
cis-1,2-Dichloroethene	ug/kg	1000	990	967	99	97	62-125	2	20	
cis-1,3-Dichloropropene	ug/kg	1000	916	938	92	94	59-125	2	20	
Dibromochloromethane	ug/kg	1000	799	863	80	86	51-125	8	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

LABORATORY CONTROL SAMPLE & LCSD: 2561113

Parameter	Units	2561114								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/kg	1000	598	492	60	49	30-125	19	20	
Ethylbenzene	ug/kg	1000	960	1020	96	102	65-125	6	20	
Hexachloro-1,3-butadiene	ug/kg	1000	753	880	75	88	58-125	16	20	
m&p-Xylene	ug/kg	2000	1890	2020	95	101	67-125	7	20	
Methyl-tert-butyl ether	ug/kg	1000	967	986	97	99	60-125	2	20	
Methylene Chloride	ug/kg	1000	972	985	97	98	57-125	1	20	
Naphthalene	ug/kg	1000	759	810	76	81	61-125	6	20	
o-Xylene	ug/kg	1000	942	994	94	99	66-125	5	20	
Styrene	ug/kg	1000	964	990	96	99	66-125	3	20	
Tetrachloroethene	ug/kg	1000	994	1020	99	102	65-125	2	20	
Tetrahydrofuran	ug/kg	10000	8300	8160	83	82	68-125	2	20	
Toluene	ug/kg	1000	917	967	92	97	67-125	5	20	
trans-1,2-Dichloroethene	ug/kg	1000	984	1040	98	104	56-125	5	20	
trans-1,3-Dichloropropene	ug/kg	1000	885	970	88	97	63-125	9	20	
Trichloroethene	ug/kg	1000	972	1030	97	103	63-125	6	20	
Trichlorofluoromethane	ug/kg	1000	783	634	78	63	35-141	21	20	R1
Vinyl acetate	ug/kg	1000	980	1020	98	102	50-125	4	20	
Vinyl chloride	ug/kg	1000	1010	854	101	85	53-125	17	20	
1,2-Dichloroethane-d4 (S)	%				104	100	75-125			
4-Bromofluorobenzene (S)	%				98	100	75-125			
Toluene-d8 (S)	%				101	103	75-125			

MATRIX SPIKE SAMPLE: 2561117

Parameter	Units	10384983003					Qualifiers
		Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	
1,1,1-Trichloroethane	ug/kg	<25.3	1120	1120	100	56-150	
1,1,2,2-Tetrachloroethane	ug/kg	<13.4	1120	1140	102	61-150	
1,1,2-Trichloroethane	ug/kg	<13.1	1120	1150	102	63-149	
1,1,2-Trichlorotrifluoroethane	ug/kg	<43.5	1120	1090	97	38-150	
1,1-Dichloroethane	ug/kg	<23.5	1120	1190	106	57-150	
1,1-Dichloroethene	ug/kg	<15.4	1120	1150	102	47-150	
1,2,4-Trichlorobenzene	ug/kg	<18.6	1120	969	86	54-150	
1,2,4-Trimethylbenzene	ug/kg	<13.3	1120	1160	103	55-150	
1,2-Dibromoethane (EDB)	ug/kg	<22.7	1120	1110	99	60-149	
1,2-Dichlorobenzene	ug/kg	<11.7	1120	1150	103	61-148	
1,2-Dichloroethane	ug/kg	<19.1	1120	1130	101	51-143	
1,3,5-Trimethylbenzene	ug/kg	<13.9	1120	1170	104	61-150	
1,3-Dichlorobenzene	ug/kg	<17.8	1120	1140	101	57-150	
1,4-Dichlorobenzene	ug/kg	<17.5	1120	1140	102	58-148	
2-Butanone (MEK)	ug/kg	<79.8	5600	7240	129	55-150	
2-Hexanone	ug/kg	<71.2	5600	7370	132	60-150	
4-Methyl-2-pentanone (MIBK)	ug/kg	<40.0	5600	7010	125	61-150	
Acetone	ug/kg	<397	5600	7080	126	58-150	
Benzene	ug/kg	<5.2	1120	1190	106	54-150	
Bromodichloromethane	ug/kg	<16.9	1120	1040	93	54-149	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

MATRIX SPIKE SAMPLE: 2561117

Parameter	Units	10384983003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromoform	ug/kg	<52.1	1120	960	86	47-143	
Bromomethane	ug/kg	<61.3	1120	845	75	36-135	
Carbon tetrachloride	ug/kg	<19.0	1120	1010	91	51-150	
Chlorobenzene	ug/kg	<10.5	1120	1170	105	58-150	
Chloroethane	ug/kg	<95.5	1120	789	70	30-150	
Chloroform	ug/kg	<29.4	1120	1060	95	56-145	
Chloromethane	ug/kg	<29.3	1120	886	79	30-131	
cis-1,2-Dichloroethene	ug/kg	<22.5	1120	1130	101	59-150	
cis-1,3-Dichloropropene	ug/kg	<27.6	1120	1110	99	57-146	
Dibromochloromethane	ug/kg	<51.9	1120	999	89	58-146	
Dichlorodifluoromethane	ug/kg	<18.5	1120	374	33	30-125	
Ethylbenzene	ug/kg	<19.2	1120	1210	108	58-150	
Hexachloro-1,3-butadiene	ug/kg	<56.8	1120	1040	93	49-150	
m&p-Xylene	ug/kg	<30.4	2240	2360	105	56-150	
Methyl-tert-butyl ether	ug/kg	<11.3	1120	1140	102	60-148	
Methylene Chloride	ug/kg	<112	1120	1140	102	52-146	
Naphthalene	ug/kg	<14.6	1120	941	84	54-150	
o-Xylene	ug/kg	<18.0	1120	1190	106	57-150	
Styrene	ug/kg	<15.7	1120	1170	105	60-150	
Tetrachloroethene	ug/kg	<23.1	1120	1240	110	62-150	
Tetrahydrofuran	ug/kg	<300	11200	9750	87	57-149	
Toluene	ug/kg	<19.2	1120	1160	103	60-150	
trans-1,2-Dichloroethene	ug/kg	<29.1	1120	1180	105	55-150	
trans-1,3-Dichloropropene	ug/kg	<20.6	1120	1090	97	60-150	
Trichloroethene	ug/kg	<17.3	1120	1180	106	59-150	
Trichlorofluoromethane	ug/kg	<60.7	1120	753	67	30-150	
Vinyl acetate	ug/kg	<64.0	1120	1150	103	30-150	
Vinyl chloride	ug/kg	<7.8	1120	956	85	31-146	
1,2-Dichloroethane-d4 (S)	%					99	75-125
4-Bromofluorobenzene (S)	%					99	75-125
Toluene-d8 (S)	%					103	75-125

SAMPLE DUPLICATE: 2561248

Parameter	Units	10385165001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	ND	<1700		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	<902		30	
1,1,2-Trichloroethane	ug/kg	ND	<877		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	<2920		30	
1,1-Dichloroethane	ug/kg	ND	<1580		30	
1,1-Dichloroethene	ug/kg	ND	<1030		30	
1,2,4-Trichlorobenzene	ug/kg	ND	<1250		30	
1,2,4-Trimethylbenzene	ug/kg	46900	43600	7	30	
1,2-Dibromoethane (EDB)	ug/kg	ND	<1530		30	
1,2-Dichlorobenzene	ug/kg	ND	<785		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

SAMPLE DUPLICATE: 2561248

Parameter	Units	10385165001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane	ug/kg	ND	<1280		30	
1,3,5-Trimethylbenzene	ug/kg	11900	10900	9	30	
1,3-Dichlorobenzene	ug/kg	ND	<1190		30	
1,4-Dichlorobenzene	ug/kg	ND	<1180		30	
2-Butanone (MEK)	ug/kg	ND	<5360		30	
2-Hexanone	ug/kg	ND	<4780		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	<2690		30	
Acetone	ug/kg	ND	28200J		30	
Benzene	ug/kg	ND	<351		30	
Bromodichloromethane	ug/kg	ND	<1140		30	
Bromoform	ug/kg	ND	<3500		30	
Bromomethane	ug/kg	ND	<4120		30	
Carbon tetrachloride	ug/kg	ND	<1280		30	
Chlorobenzene	ug/kg	14700	7020	70	30	D6
Chloroethane	ug/kg	ND	<6420		30	
Chloroform	ug/kg	ND	<1970		30	
Chloromethane	ug/kg	ND	<1970		30	
cis-1,2-Dichloroethene	ug/kg	ND	<1510		30	
cis-1,3-Dichloropropene	ug/kg	ND	<1850		30	
Dibromochloromethane	ug/kg	ND	<3480		30	
Dichlorodifluoromethane	ug/kg	ND	<1240		30	
Ethylbenzene	ug/kg	6610	3920J		30	
Hexachloro-1,3-butadiene	ug/kg	ND	<3820		30	
m&p-Xylene	ug/kg	25200	15300	49	30	D6
Methyl-tert-butyl ether	ug/kg	ND	<760		30	
Methylene Chloride	ug/kg	ND	<7520		30	
Naphthalene	ug/kg	57800	54600	6	30	
o-Xylene	ug/kg	14100	10700	27	30	
Styrene	ug/kg	ND	<1060		30	
Tetrachloroethene	ug/kg	ND	1990J		30	
Tetrahydrofuran	ug/kg	ND	<20100		30	
Toluene	ug/kg	23800	11800	68	30	D6
trans-1,2-Dichloroethene	ug/kg	ND	<1960		30	
trans-1,3-Dichloropropene	ug/kg	ND	<1380		30	
Trichloroethene	ug/kg	152000	81100	61	30	D6
Trichlorofluoromethane	ug/kg	ND	<4080		30	
Vinyl acetate	ug/kg	ND	<4300		30	
Vinyl chloride	ug/kg	ND	<521		30	
1,2-Dichloroethane-d4 (S)	%	98	96	4		
4-Bromofluorobenzene (S)	%	102	101	3		
Toluene-d8 (S)	%	103	102	3		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch: 469076

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10384983001, 10384983002

METHOD BLANK: 2561602

Matrix: Water

Associated Lab Samples: 10384983001, 10384983002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	1.0	0.064	04/18/17 12:26	MN
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	04/18/17 12:26	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	04/18/17 12:26	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	04/18/17 12:26	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	04/18/17 12:26	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	04/18/17 12:26	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	04/18/17 12:26	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	04/18/17 12:26	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	04/18/17 12:26	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	04/18/17 12:26	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	04/18/17 12:26	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	04/18/17 12:26	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	10.0	0.60	04/18/17 12:26	MN
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	04/18/17 12:26	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	04/18/17 12:26	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	04/18/17 12:26	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	04/18/17 12:26	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	04/18/17 12:26	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	04/18/17 12:26	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	04/18/17 12:26	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	04/18/17 12:26	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	04/18/17 12:26	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	04/18/17 12:26	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	04/18/17 12:26	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	04/18/17 12:26	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	04/18/17 12:26	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	04/18/17 12:26	
2-Hexanone	ug/L	<0.19	5.0	0.19	04/18/17 12:26	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	04/18/17 12:26	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	04/18/17 12:26	
Acetone	ug/L	<0.64	20.0	0.64	04/18/17 12:26	
Acrolein	ug/L	<2.1	10.0	2.1	04/18/17 12:26	
Acrylonitrile	ug/L	<0.49	10.0	0.49	04/18/17 12:26	
Benzene	ug/L	<0.042	0.50	0.042	04/18/17 12:26	
Bromobenzene	ug/L	<0.087	0.50	0.087	04/18/17 12:26	
Bromochloromethane	ug/L	<0.082	1.0	0.082	04/18/17 12:26	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	04/18/17 12:26	
Bromoform	ug/L	<0.11	4.0	0.11	04/18/17 12:26	
Bromomethane	ug/L	<0.20	4.0	0.20	04/18/17 12:26	
Carbon disulfide	ug/L	<0.20	1.0	0.20	04/18/17 12:26	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	04/18/17 12:26	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

METHOD BLANK: 2561602

Matrix: Water

Associated Lab Samples: 10384983001, 10384983002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	04/18/17 12:26	
Chloroethane	ug/L	<0.12	1.0	0.12	04/18/17 12:26	
Chloroform	ug/L	<0.21	1.0	0.21	04/18/17 12:26	
Chloromethane	ug/L	<0.080	4.0	0.080	04/18/17 12:26	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	04/18/17 12:26	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	04/18/17 12:26	
Dibromochloromethane	ug/L	<0.048	1.0	0.048	04/18/17 12:26	MN
Dibromomethane	ug/L	<0.14	1.0	0.14	04/18/17 12:26	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	04/18/17 12:26	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	04/18/17 12:26	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	04/18/17 12:26	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	04/18/17 12:26	
Ethylbenzene	ug/L	<0.075	0.50	0.075	04/18/17 12:26	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	04/18/17 12:26	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	04/18/17 12:26	
m&p-Xylene	ug/L	<0.11	1.0	0.11	04/18/17 12:26	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	04/18/17 12:26	
Methylene Chloride	ug/L	<0.097	4.0	0.097	04/18/17 12:26	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	04/18/17 12:26	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	04/18/17 12:26	
Naphthalene	ug/L	<0.064	4.0	0.064	04/18/17 12:26	MN
o-Xylene	ug/L	<0.044	0.50	0.044	04/18/17 12:26	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	04/18/17 12:26	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	04/18/17 12:26	
Styrene	ug/L	<0.056	0.50	0.056	04/18/17 12:26	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	04/18/17 12:26	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	04/18/17 12:26	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	04/18/17 12:26	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	04/18/17 12:26	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	04/18/17 12:26	
Toluene	ug/L	<0.059	0.50	0.059	04/18/17 12:26	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	04/18/17 12:26	
trans-1,3-Dichloropropene	ug/L	<0.044	1.0	0.044	04/18/17 12:26	MN
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	04/18/17 12:26	
Trichloroethene	ug/L	<0.044	0.40	0.044	04/18/17 12:26	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	04/18/17 12:26	
Vinyl acetate	ug/L	<0.12	10.0	0.12	04/18/17 12:26	
Vinyl chloride	ug/L	<0.098	0.20	0.098	04/18/17 12:26	
Xylene (Total)	ug/L	<0.15	1.5	0.15	04/18/17 12:26	
1,2-Dichloroethane-d4 (S)	%	107	75-137		04/18/17 12:26	
4-Bromofluorobenzene (S)	%	103	75-125		04/18/17 12:26	
Toluene-d8 (S)	%	102	75-125		04/18/17 12:26	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

LABORATORY CONTROL SAMPLE & LCSD: 2561603		2561604									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.6	20.8	103	104	75-136	1	30		
1,1,1-Trichloroethane	ug/L	20	21.9	21.3	109	107	75-129	3	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.9	21.1	105	106	71-138	1	30		
1,1,2-Trichloroethane	ug/L	20	21.3	20.9	106	105	75-125	2	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.8	20.5	104	103	69-126	1	30		
1,1-Dichloroethane	ug/L	20	18.6	18.6	93	93	75-125	0	30		
1,1-Dichloroethene	ug/L	20	18.6	18.2	93	91	75-125	2	30		
1,1-Dichloropropene	ug/L	20	20.1	19.8	100	99	75-125	2	30		
1,2,3-Trichlorobenzene	ug/L	20	20.7	22.1	103	110	75-125	7	30		
1,2,3-Trichloropropane	ug/L	20	20.1	21.4	101	107	75-125	6	30		
1,2,4-Trichlorobenzene	ug/L	20	22.2	22.9	111	114	75-125	3	30		
1,2,4-Trimethylbenzene	ug/L	20	20.8	21.4	104	107	75-125	3	30		
1,2-Dibromo-3-chloropropane	ug/L	50	47.8	49.0	96	98	71-130	2	30		
1,2-Dibromoethane (EDB)	ug/L	20	21.8	21.6	109	108	75-125	1	30		
1,2-Dichlorobenzene	ug/L	20	19.9	20.9	99	104	75-125	5	30		
1,2-Dichloroethane	ug/L	20	19.6	20.0	98	100	70-125	2	30		
1,2-Dichloroethene (Total)	ug/L	40	39.7	39.4	99	99	75-125	1	30		
1,2-Dichloropropane	ug/L	20	19.5	19.8	97	99	75-125	1	30		
1,3,5-Trimethylbenzene	ug/L	20	20.9	21.1	105	106	75-125	1	30		
1,3-Dichlorobenzene	ug/L	20	20.2	21.0	101	105	75-125	4	30		
1,3-Dichloropropane	ug/L	20	20.4	20.4	102	102	75-125	0	30		
1,4-Dichlorobenzene	ug/L	20	19.1	19.7	95	99	75-125	3	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	405	389	101	97	64-140	4	30		
2,2,4-Trimethylpentane	ug/L	20	20.9	20.5	105	102	68-125	2	30		
2,2-Dichloropropane	ug/L	20	23.2	22.4	116	112	70-131	4	30		
2-Butanone (MEK)	ug/L	100	94.0	90.9	94	91	69-125	3	30		
2-Chlorotoluene	ug/L	20	19.9	20.6	99	103	75-125	3	30		
2-Hexanone	ug/L	100	106	101	106	101	73-129	5	30		
4-Chlorotoluene	ug/L	20	20.7	21.4	103	107	75-125	3	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	99.8	103	100	73-125	3	30		
Acetone	ug/L	100	122	121	122	121	66-126	1	30		
Acrolein	ug/L	200	204	203	102	102	56-150	0	30		
Acrylonitrile	ug/L	200	175	173	87	87	68-129	1	30		
Benzene	ug/L	20	19.0	18.9	95	95	75-125	0	30		
Bromobenzene	ug/L	20	20.4	21.3	102	106	75-125	4	30		
Bromochloromethane	ug/L	20	20.2	20.3	101	102	75-126	1	30		
Bromodichloromethane	ug/L	20	20.7	20.9	104	104	75-133	1	30		
Bromoform	ug/L	20	19.4	19.7	97	98	62-142	1	30		
Bromomethane	ug/L	20	23.0	25.2	115	126	34-143	9	30		
Carbon disulfide	ug/L	20	18.5	18.2	93	91	71-125	2	30		
Carbon tetrachloride	ug/L	20	21.0	21.4	105	107	71-145	1	30		
Chlorobenzene	ug/L	20	19.4	19.4	97	97	75-125	0	30		
Chloroethane	ug/L	20	20.4	20.4	102	102	75-125	0	30		
Chloroform	ug/L	20	19.4	19.4	97	97	75-125	0	30		
Chloromethane	ug/L	20	20.9	20.9	104	104	54-125	0	30		
cis-1,2-Dichloroethene	ug/L	20	20.5	20.0	102	100	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	20	21.1	21.2	106	106	75-125	0	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

LABORATORY CONTROL SAMPLE & LCSD: 2561603		2561604								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.3	20.0	102	100	74-141	2	30	
Dibromomethane	ug/L	20	20.4	20.2	102	101	75-125	1	30	
Dichlorodifluoromethane	ug/L	20	20.7	20.5	104	102	59-130	1	30	
Dichlorofluoromethane	ug/L	20	20.3	19.9	102	99	75-125	2	30	
Diisopropyl ether	ug/L	20	17.8	18.2	89	91	69-125	2	30	
Ethyl-tert-butyl ether	ug/L	20	19.2	19.7	96	99	73-125	3	30	
Ethylbenzene	ug/L	20	19.2	18.6	96	93	75-125	3	30	
Hexachloro-1,3-butadiene	ug/L	20	21.9	22.7	109	113	75-131	3	30	
Isopropylbenzene (Cumene)	ug/L	20	21.2	20.9	106	104	75-125	2	30	
m&p-Xylene	ug/L	40	40.7	39.7	102	99	75-125	2	30	
Methyl-tert-butyl ether	ug/L	20	20.3	20.6	101	103	75-125	2	30	
Methylene Chloride	ug/L	20	19.4	19.6	97	98	73-125	1	30	
n-Butylbenzene	ug/L	20	22.1	22.5	110	112	75-125	2	30	
n-Propylbenzene	ug/L	20	20.0	20.5	100	102	75-125	2	30	
Naphthalene	ug/L	20	19.4	20.5	97	103	74-125	5	30	
o-Xylene	ug/L	20	20.5	20.1	103	101	75-125	2	30	
p-Isopropyltoluene	ug/L	20	21.9	22.3	110	112	75-125	2	30	
sec-Butylbenzene	ug/L	20	20.9	21.5	105	107	75-125	3	30	
Styrene	ug/L	20	21.7	21.4	109	107	75-125	2	30	
tert-Amylmethyl ether	ug/L	20	19.5	19.8	98	99	71-126	2	30	
tert-Butyl Alcohol	ug/L	200	219	210	109	105	69-131	4	30	
tert-Butylbenzene	ug/L	20	20.9	21.2	104	106	75-125	1	30	
Tetrachloroethene	ug/L	20	20.3	19.7	101	99	75-125	3	30	
Tetrahydrofuran	ug/L	200	223	233	111	117	65-127	5	30	
Toluene	ug/L	20	19.6	19.3	98	96	75-125	2	30	
trans-1,2-Dichloroethene	ug/L	20	19.2	19.4	96	97	75-125	1	30	
trans-1,3-Dichloropropene	ug/L	20	20.3	20.0	101	100	75-125	1	30	
trans-1,4-Dichloro-2-butene	ug/L	50	51.4	51.1	103	102	30-150	1	30	
Trichloroethene	ug/L	20	20.7	20.8	103	104	75-125	1	30	
Trichlorofluoromethane	ug/L	20	22.2	22.1	111	111	71-140	0	30	
Vinyl acetate	ug/L	20	19.6	19.8	98	99	68-137	1	30	
Vinyl chloride	ug/L	20	19.8	19.8	99	99	70-125	0	30	
Xylene (Total)	ug/L	60	61.2	59.8	102	100	75-125	2	30	
1,2-Dichloroethane-d4 (S)	%				106	105	75-137			
4-Bromofluorobenzene (S)	%				102	105	75-125			
Toluene-d8 (S)	%				102	103	75-125			

MATRIX SPIKE SAMPLE: 2561605		10384983001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20.3	102	75-137	
1,1,1-Trichloroethane	ug/L	<0.057	20	23.3	117	75-139	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20.1	100	60-142	
1,1,2-Trichloroethane	ug/L	<0.064	20	20.4	102	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	24.5	122	62-150	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

MATRIX SPIKE SAMPLE: 2561605		10384983001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.055	20	19.6	98	70-129	
1,1-Dichloroethene	ug/L	<0.069	20	20.8	104	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	21.6	108	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	22.1	111	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	19.5	97	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	23.6	118	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	21.0	105	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	45.7	91	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	21.0	105	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	20.3	102	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	19.9	99	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.16	40	41.3	103	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	19.6	98	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20.9	104	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	20.8	104	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	20.0	100	67-128	
1,4-Dichlorobenzene	ug/L	<0.081	20	19.1	96	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	369	92	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	25.3	127	48-150	
2,2-Dichloropropane	ug/L	<0.096	20	24.7	124	50-150	
2-Butanone (MEK)	ug/L	<1.1	100	82.3	82	58-125	
2-Chlorotoluene	ug/L	<0.084	20	20.2	101	65-138	
2-Hexanone	ug/L	<0.19	100	96.4	96	61-134	
4-Chlorotoluene	ug/L	<0.048	20	20.7	103	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	96.9	97	61-130	
Acetone	ug/L	1.7J	100	102	101	51-140	
Acrolein	ug/L	<2.1	200	208	104	48-150	
Acrylonitrile	ug/L	<0.49	200	164	82	55-134	
Benzene	ug/L	<0.042	20	19.5	97	63-132	
Bromobenzene	ug/L	<0.087	20	21.0	105	67-138	
Bromochloromethane	ug/L	<0.082	20	20.7	103	66-138	
Bromodichloromethane	ug/L	<0.068	20	20.5	103	75-137	
Bromoform	ug/L	<0.11	20	19.0	95	65-129	
Bromomethane	ug/L	<0.20	20	27.5	137	41-150	
Carbon disulfide	ug/L	<0.20	20	20.5	103	72-132	
Carbon tetrachloride	ug/L	<0.079	20	23.2	116	75-150	
Chlorobenzene	ug/L	<0.066	20	19.5	98	73-127	
Chloroethane	ug/L	<0.12	20	22.1	111	74-138	
Chloroform	ug/L	<0.21	20	20.0	100	74-125	
Chloromethane	ug/L	<0.080	20	22.9	115	58-129	
cis-1,2-Dichloroethene	ug/L	<0.12	20	20.8	104	63-135	
cis-1,3-Dichloropropene	ug/L	<0.069	20	20.8	104	66-129	
Dibromochloromethane	ug/L	<0.048	20	19.8	99	75-133	
Dibromomethane	ug/L	<0.14	20	20.2	101	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	25.7	129	72-150	
Dichlorofluoromethane	ug/L	<0.054	20	21.7	108	75-129	
Diisopropyl ether	ug/L	<0.050	20	17.9	89	62-128	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

MATRIX SPIKE SAMPLE: 2561605		10384983001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	19.4	97	63-132	
Ethylbenzene	ug/L	<0.075	20	18.8	94	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	26.0	130	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20.9	105	70-136	
m&p-Xylene	ug/L	<0.11	40	39.9	100	64-142	
Methyl-tert-butyl ether	ug/L	<0.047	20	20.0	100	72-125	
Methylene Chloride	ug/L	<0.097	20	19.1	96	60-132	
n-Butylbenzene	ug/L	<0.16	20	23.5	118	60-150	
n-Propylbenzene	ug/L	<0.049	20	20.4	102	63-142	
Naphthalene	ug/L	<0.064	20	19.1	95	67-125	
o-Xylene	ug/L	<0.044	20	20.2	101	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	22.6	113	64-146	
sec-Butylbenzene	ug/L	<0.094	20	22.1	110	67-144	
Styrene	ug/L	<0.056	20	21.4	107	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	19.7	98	60-134	
tert-Butyl Alcohol	ug/L	<0.89	200	208	104	56-146	
tert-Butylbenzene	ug/L	<0.051	20	21.3	106	68-135	
Tetrachloroethene	ug/L	<0.13	20	20.6	103	67-148	
Tetrahydrofuran	ug/L	<1.5	200	220	110	51-141	
Toluene	ug/L	0.18J	20	19.8	98	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	20.5	103	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20.0	100	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	48.4	97	30-150	
Trichloroethene	ug/L	<0.044	20	21.6	108	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	26.3	132	75-150	
Vinyl acetate	ug/L	<0.12	20	19.6	98	49-143	
Vinyl chloride	ug/L	<0.098	20	22.7	114	75-133	
Xylene (Total)	ug/L	<0.15	60	60.1	100	63-142	
1,2-Dichloroethane-d4 (S)	%				105	75-137	
4-Bromofluorobenzene (S)	%				103	75-125	
Toluene-d8 (S)	%				102	75-125	

SAMPLE DUPLICATE: 2561674

Parameter	Units	10384151009	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	ND	<0.064		30	
1,1,1-Trichloroethane	ug/L	ND	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	<0.055		30	
1,1,2-Trichloroethane	ug/L	ND	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	<0.13		30	
1,1-Dichloroethane	ug/L	ND	<0.055		30	
1,1-Dichloroethene	ug/L	ND	<0.069		30	
1,1-Dichloropropene	ug/L	ND	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	ND	<0.17		30	
1,2,3-Trichloropropane	ug/L	ND	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

SAMPLE DUPLICATE: 2561674

Parameter	Units	10384151009 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	ND	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	ND	<0.092		30	
1,2-Dichlorobenzene	ug/L	ND	<0.078		30	
1,2-Dichloroethane	ug/L	ND	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	ND	<0.16		30	
1,2-Dichloropropane	ug/L	ND	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	ND	<0.042		30	
1,3-Dichlorobenzene	ug/L	ND	<0.085		30	
1,3-Dichloropropane	ug/L	ND	<0.059		30	
1,4-Dichlorobenzene	ug/L	ND	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	<4.8		30	
2,2,4-Trimethylpentane	ug/L	ND	<0.087		30	
2,2-Dichloropropane	ug/L	ND	<0.096		30	
2-Butanone (MEK)	ug/L	ND	<1.1		30	
2-Chlorotoluene	ug/L	ND	<0.084		30	
2-Hexanone	ug/L	ND	<0.19		30	
4-Chlorotoluene	ug/L	ND	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	<0.80		30	
Acetone	ug/L	ND	<0.64		30	
Acrolein	ug/L	ND	<2.1		30	
Acrylonitrile	ug/L	ND	<0.49		30	
Benzene	ug/L	ND	<0.042		30	
Bromobenzene	ug/L	ND	<0.087		30	
Bromochloromethane	ug/L	ND	<0.082		30	
Bromodichloromethane	ug/L	ND	<0.068		30	
Bromoform	ug/L	ND	<0.11		30	
Bromomethane	ug/L	ND	<0.20		30	
Carbon disulfide	ug/L	ND	<0.20		30	
Carbon tetrachloride	ug/L	ND	<0.079		30	
Chlorobenzene	ug/L	ND	<0.066		30	
Chloroethane	ug/L	ND	<0.12		30	
Chloroform	ug/L	ND	<0.21		30	
Chloromethane	ug/L	ND	<0.080		30	
cis-1,2-Dichloroethene	ug/L	ND	<0.12		30	
cis-1,3-Dichloropropene	ug/L	ND	<0.069		30	
Dibromochloromethane	ug/L	ND	<0.048		30	
Dibromomethane	ug/L	ND	<0.14		30	
Dichlorodifluoromethane	ug/L	7.6	7.2	4	30	
Dichlorofluoromethane	ug/L	ND	<0.054		30	
Diisopropyl ether	ug/L	ND	<0.050		30	
Ethyl-tert-butyl ether	ug/L	ND	<0.062		30	
Ethylbenzene	ug/L	ND	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	ND	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	ND	<0.064		30	
m&p-Xylene	ug/L	ND	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

SAMPLE DUPLICATE: 2561674

Parameter	Units	10384151009 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	ND	<0.047		30	
Methylene Chloride	ug/L	ND	<0.097		30	
n-Butylbenzene	ug/L	ND	<0.16		30	
n-Propylbenzene	ug/L	ND	<0.049		30	
Naphthalene	ug/L	ND	<0.064		30	
o-Xylene	ug/L	ND	<0.044		30	
p-Isopropyltoluene	ug/L	ND	<0.064		30	
sec-Butylbenzene	ug/L	ND	<0.094		30	
Styrene	ug/L	ND	<0.056		30	
tert-Amylmethyl ether	ug/L	ND	<0.073		30	
tert-Butyl Alcohol	ug/L	ND	<0.89		30	
tert-Butylbenzene	ug/L	ND	<0.051		30	
Tetrachloroethene	ug/L	ND	<0.13		30	
Tetrahydrofuran	ug/L	ND	<1.5		30	
Toluene	ug/L	ND	<0.059		30	
trans-1,2-Dichloroethene	ug/L	ND	<0.15		30	
trans-1,3-Dichloropropene	ug/L	ND	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	<0.45		30	
Trichloroethene	ug/L	ND	<0.044		30	
Trichlorofluoromethane	ug/L	ND	<0.055		30	
Vinyl acetate	ug/L	ND	<0.12		30	
Vinyl chloride	ug/L	ND	<0.098		30	
Xylene (Total)	ug/L	ND	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	106	107	0		
4-Bromofluorobenzene (S)	%	104	103	1		
Toluene-d8 (S)	%	101	101	0		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 468571 Analysis Method: EPA 8270D  
QC Batch Method: EPA 3550 Analysis Description: 8270D Solid MSSV  
Associated Lab Samples: 10384983003

METHOD BLANK: 2559148 Matrix: Solid  
Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	<52.9	330	52.9	04/17/17 20:41	
1,2-Dichlorobenzene	ug/kg	<49.3	330	49.3	04/17/17 20:41	
1,2-Diphenylhydrazine	ug/kg	<21.6	330	21.6	04/17/17 20:41	
1,3-Dichlorobenzene	ug/kg	<45.1	330	45.1	04/17/17 20:41	
1,4-Dichlorobenzene	ug/kg	<51.7	330	51.7	04/17/17 20:41	
1-Methylnaphthalene	ug/kg	<38.5	330	38.5	04/17/17 20:41	
2,4,5-Trichlorophenol	ug/kg	<35.7	330	35.7	04/17/17 20:41	
2,4,6-Trichlorophenol	ug/kg	<17.4	330	17.4	04/17/17 20:41	
2,4-Dichlorophenol	ug/kg	<34.2	330	34.2	04/17/17 20:41	
2,4-Dimethylphenol	ug/kg	<47.9	330	47.9	04/17/17 20:41	
2,4-Dinitrophenol	ug/kg	<30.9	330	30.9	04/17/17 20:41	
2,4-Dinitrotoluene	ug/kg	<25.7	330	25.7	04/17/17 20:41	
2,6-Dinitrotoluene	ug/kg	<42.9	330	42.9	04/17/17 20:41	
2-Chloronaphthalene	ug/kg	<36.5	330	36.5	04/17/17 20:41	
2-Chlorophenol	ug/kg	<41.4	330	41.4	04/17/17 20:41	
2-Methylnaphthalene	ug/kg	<37.0	330	37.0	04/17/17 20:41	
2-Methylphenol(o-Cresol)	ug/kg	<37.0	330	37.0	04/17/17 20:41	
2-Nitroaniline	ug/kg	<58.6	330	58.6	04/17/17 20:41	
2-Nitrophenol	ug/kg	<40.1	330	40.1	04/17/17 20:41	
3&4-Methylphenol(m&p Cresol)	ug/kg	<39.7	660	39.7	04/17/17 20:41	
3,3'-Dichlorobenzidine	ug/kg	<42.8	330	42.8	04/17/17 20:41	
3-Nitroaniline	ug/kg	<37.8	330	37.8	04/17/17 20:41	
4,6-Dinitro-2-methylphenol	ug/kg	<34.4	1700	34.4	04/17/17 20:41	
4-Bromophenylphenyl ether	ug/kg	74.4J	330	20.4	04/17/17 20:41	
4-Chloro-3-methylphenol	ug/kg	<24.9	330	24.9	04/17/17 20:41	
4-Chloroaniline	ug/kg	<57.4	330	57.4	04/17/17 20:41	
4-Chlorophenylphenyl ether	ug/kg	<19.4	330	19.4	04/17/17 20:41	
4-Nitroaniline	ug/kg	<37.9	330	37.9	04/17/17 20:41	
4-Nitrophenol	ug/kg	<37.3	330	37.3	04/17/17 20:41	
Acenaphthene	ug/kg	<16.6	330	16.6	04/17/17 20:41	
Acenaphthylene	ug/kg	<17.5	330	17.5	04/17/17 20:41	
Anthracene	ug/kg	<17.0	330	17.0	04/17/17 20:41	
Benzo(a)anthracene	ug/kg	<10.0	330	10.0	04/17/17 20:41	
Benzo(a)pyrene	ug/kg	<20.1	330	20.1	04/17/17 20:41	
Benzo(b)fluoranthene	ug/kg	<21.3	330	21.3	04/17/17 20:41	
Benzo(g,h,i)perylene	ug/kg	<40.0	330	40.0	04/17/17 20:41	
Benzo(k)fluoranthene	ug/kg	<19.0	330	19.0	04/17/17 20:41	
bis(2-Chloroethoxy)methane	ug/kg	<51.5	330	51.5	04/17/17 20:41	
bis(2-Chloroethyl) ether	ug/kg	<48.1	330	48.1	04/17/17 20:41	
bis(2-Chloroisopropyl) ether	ug/kg	<53.9	330	53.9	04/17/17 20:41	
bis(2-Ethylhexyl)phthalate	ug/kg	<42.1	330	42.1	04/17/17 20:41	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

METHOD BLANK: 2559148 Matrix: Solid  
Associated Lab Samples: 10384983003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Butylbenzylphthalate	ug/kg	<40.5	330	40.5	04/17/17 20:41	
Carbazole	ug/kg	<18.5	330	18.5	04/17/17 20:41	
Chrysene	ug/kg	<10.0	330	10.0	04/17/17 20:41	
Di-n-butylphthalate	ug/kg	<19.2	330	19.2	04/17/17 20:41	
Di-n-octylphthalate	ug/kg	<38.4	330	38.4	04/17/17 20:41	
Dibenz(a,h)anthracene	ug/kg	<32.9	330	32.9	04/17/17 20:41	
Dibenzofuran	ug/kg	<12.9	330	12.9	04/17/17 20:41	
Diethylphthalate	ug/kg	<17.9	330	17.9	04/17/17 20:41	
Dimethylphthalate	ug/kg	<18.3	330	18.3	04/17/17 20:41	
Fluoranthene	ug/kg	<19.4	330	19.4	04/17/17 20:41	
Fluorene	ug/kg	18.1J	330	10.0	04/17/17 20:41	
Hexachloro-1,3-butadiene	ug/kg	<46.9	330	46.9	04/17/17 20:41	
Hexachlorobenzene	ug/kg	<17.8	330	17.8	04/17/17 20:41	
Hexachloroethane	ug/kg	<56.1	330	56.1	04/17/17 20:41	
Indeno(1,2,3-cd)pyrene	ug/kg	<17.0	330	17.0	04/17/17 20:41	
Isophorone	ug/kg	<38.9	330	38.9	04/17/17 20:41	
N-Nitroso-di-n-propylamine	ug/kg	<45.6	330	45.6	04/17/17 20:41	
N-Nitrosodimethylamine	ug/kg	<58.7	330	58.7	04/17/17 20:41	
N-Nitrosodiphenylamine	ug/kg	<17.4	330	17.4	04/17/17 20:41	
Naphthalene	ug/kg	<46.5	330	46.5	04/17/17 20:41	
Nitrobenzene	ug/kg	<60.3	330	60.3	04/17/17 20:41	
Pentachlorophenol	ug/kg	<35.4	670	35.4	04/17/17 20:41	
Phenanthrene	ug/kg	<18.0	330	18.0	04/17/17 20:41	
Phenol	ug/kg	<42.6	330	42.6	04/17/17 20:41	
Pyrene	ug/kg	<10.0	330	10.0	04/17/17 20:41	
2,4,6-Tribromophenol (S)	%	73	30-141		04/17/17 20:41	
2-Fluorobiphenyl (S)	%	83	30-130		04/17/17 20:41	
2-Fluorophenol (S)	%	83	30-125		04/17/17 20:41	
Nitrobenzene-d5 (S)	%	80	30-125		04/17/17 20:41	
p-Terphenyl-d14 (S)	%	100	30-148		04/17/17 20:41	
Phenol-d6 (S)	%	86	30-125		04/17/17 20:41	

LABORATORY CONTROL SAMPLE: 2559149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trichlorobenzene	ug/kg	1670	1200	72	36-125	
1,2-Dichlorobenzene	ug/kg	1670	1280	77	30-125	
1,2-Diphenylhydrazine	ug/kg	1670	1460	88	50-125	
1,3-Dichlorobenzene	ug/kg	1670	1260	75	30-125	
1,4-Dichlorobenzene	ug/kg	1670	1260	75	30-125	
1-Methylnaphthalene	ug/kg	1670	1250	75	46-125	
2,4,5-Trichlorophenol	ug/kg	1670	1400	84	52-125	
2,4,6-Trichlorophenol	ug/kg	1670	1380	83	52-125	
2,4-Dichlorophenol	ug/kg	1670	1220	73	48-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

LABORATORY CONTROL SAMPLE: 2559149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2,4-Dimethylphenol	ug/kg	1670	1190	72	41-125	
2,4-Dinitrophenol	ug/kg	1670	1060	64	30-125	
2,4-Dinitrotoluene	ug/kg	1670	1490	89	56-125	
2,6-Dinitrotoluene	ug/kg	1670	1490	89	57-125	
2-Chloronaphthalene	ug/kg	1670	1330	80	52-125	
2-Chlorophenol	ug/kg	1670	1300	78	37-125	
2-Methylnaphthalene	ug/kg	1670	1230	74	45-125	
2-Methylphenol(o-Cresol)	ug/kg	1670	1300	78	42-125	
2-Nitroaniline	ug/kg	1670	1520	91	52-125	
2-Nitrophenol	ug/kg	1670	1250	75	39-125	
3&4-Methylphenol(m&p Cresol)	ug/kg	1670	1310	79	44-125	
3,3'-Dichlorobenzidine	ug/kg	1670	1330	80	30-125	
3-Nitroaniline	ug/kg	1670	1380	83	39-125	
4,6-Dinitro-2-methylphenol	ug/kg	1670	1200J	72	30-128	
4-Bromophenylphenyl ether	ug/kg	1670	1420	85	59-125	
4-Chloro-3-methylphenol	ug/kg	1670	1320	79	52-125	
4-Chloroaniline	ug/kg	1670	989	59	30-125	
4-Chlorophenylphenyl ether	ug/kg	1670	1390	83	56-125	
4-Nitroaniline	ug/kg	1670	1420	85	49-125	
4-Nitrophenol	ug/kg	1670	1490	89	42-125	
Acenaphthene	ug/kg	1670	1350	81	53-125	
Acenaphthylene	ug/kg	1670	1360	82	54-125	
Anthracene	ug/kg	1670	1420	85	59-125	
Benzo(a)anthracene	ug/kg	1670	1460	88	59-125	
Benzo(a)pyrene	ug/kg	1670	1440	86	58-125	
Benzo(b)fluoranthene	ug/kg	1670	1460	88	59-125	
Benzo(g,h,i)perylene	ug/kg	1670	1440	86	59-125	
Benzo(k)fluoranthene	ug/kg	1670	1430	86	59-125	
bis(2-Chloroethoxy)methane	ug/kg	1670	1270	76	41-125	
bis(2-Chloroethyl) ether	ug/kg	1670	1320	79	30-125	
bis(2-Chloroisopropyl) ether	ug/kg	1670	1320	79	30-125	
bis(2-Ethylhexyl)phthalate	ug/kg	1670	1480	89	56-125	
Butylbenzylphthalate	ug/kg	1670	1540	92	57-125	
Carbazole	ug/kg	1670	1460	88	57-125	
Chrysene	ug/kg	1670	1440	86	59-125	
Di-n-butylphthalate	ug/kg	1670	1570	94	59-125	
Di-n-octylphthalate	ug/kg	1670	1430	86	59-125	
Dibenz(a,h)anthracene	ug/kg	1670	1440	87	59-125	
Dibenzofuran	ug/kg	1670	1380	83	54-125	
Diethylphthalate	ug/kg	1670	1450	87	57-125	
Dimethylphthalate	ug/kg	1670	1440	86	57-125	
Fluoranthene	ug/kg	1670	1430	86	59-125	
Fluorene	ug/kg	1670	1390	83	56-125	
Hexachloro-1,3-butadiene	ug/kg	1670	1180	71	32-125	
Hexachlorobenzene	ug/kg	1670	1390	83	58-125	
Hexachloroethane	ug/kg	1670	1270	76	30-125	
Indeno(1,2,3-cd)pyrene	ug/kg	1670	1450	87	59-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

LABORATORY CONTROL SAMPLE: 2559149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isophorone	ug/kg	1670	1290	78	45-125	
N-Nitroso-di-n-propylamine	ug/kg	1670	1350	81	38-125	
N-Nitrosodimethylamine	ug/kg	1670	1410	84	30-127	
N-Nitrosodiphenylamine	ug/kg	1670	1430	86	30-127	
Naphthalene	ug/kg	1670	1230	74	39-125	
Nitrobenzene	ug/kg	1670	1270	76	37-125	
Pentachlorophenol	ug/kg	1670	1240	74	32-125	
Phenanthrene	ug/kg	1670	1430	86	59-125	
Phenol	ug/kg	1670	1300	78	39-125	
Pyrene	ug/kg	1670	1470	88	58-125	
2,4,6-Tribromophenol (S)	%			90	30-141	
2-Fluorobiphenyl (S)	%			83	30-130	
2-Fluorophenol (S)	%			82	30-125	
Nitrobenzene-d5 (S)	%			79	30-125	
p-Terphenyl-d14 (S)	%			97	30-148	
Phenol-d6 (S)	%			82	30-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2559151 2559152

Parameter	Units	10384777001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
1,2,4-Trichlorobenzene	ug/kg	<68.8	2170	2170	1630	1580	75	73	42-125	3	30		
1,2-Dichlorobenzene	ug/kg	<64.1	2170	2170	1710	1660	79	76	31-125	3	30		
1,2-Diphenylhydrazine	ug/kg	<28.1	2170	2170	1920	1870	89	86	53-125	3	30		
1,3-Dichlorobenzene	ug/kg	<58.7	2170	2170	1710	1640	79	76	30-125	4	30		
1,4-Dichlorobenzene	ug/kg	<67.3	2170	2170	1700	1640	78	76	30-125	3	30		
1-Methylnaphthalene	ug/kg	<50.1	2170	2170	1730	1700	80	78	51-125	2	30		
2,4,5-Trichlorophenol	ug/kg	<46.4	2170	2170	1860	1870	86	86	30-132	1	30		
2,4,6-Trichlorophenol	ug/kg	<22.6	2170	2170	1870	1840	86	85	53-125	2	30		
2,4-Dichlorophenol	ug/kg	<44.5	2170	2170	1750	1730	81	80	53-125	1	30		
2,4-Dimethylphenol	ug/kg	<62.3	2170	2170	1760	1730	81	80	53-125	1	30		
2,4-Dinitrophenol	ug/kg	<40.2	2170	2170	416J	494	19	23	30-125		30	M1	
2,4-Dinitrotoluene	ug/kg	<33.4	2170	2170	1980	1960	91	90	30-144	1	30		
2,6-Dinitrotoluene	ug/kg	<55.8	2170	2170	1950	1910	90	88	30-142	2	30		
2-Chloronaphthalene	ug/kg	<47.5	2170	2170	1780	1760	82	81	56-125	1	30		
2-Chlorophenol	ug/kg	<53.9	2170	2170	1800	1760	83	81	46-125	2	30		
2-Methylnaphthalene	ug/kg	<48.1	2170	2170	1680	1670	78	77	51-125	1	30		
2-Methylphenol(o-Cresol)	ug/kg	<48.1	2170	2170	1830	1800	84	83	51-125	2	30		
2-Nitroaniline	ug/kg	<76.2	2170	2170	2080	2020	96	93	30-137	3	30		
2-Nitrophenol	ug/kg	<52.2	2170	2170	1640	1670	76	77	30-125	2	30		
3&4-Methylphenol(m&p Cresol)	ug/kg	<51.7	2170	2170	1870	1830	86	85	53-125	2	30		
3,3'-Dichlorobenzidine	ug/kg	<55.7	2170	2170	2000	2050	92	95	30-132	3	30		
3-Nitroaniline	ug/kg	<49.2	2170	2170	1910	1950	88	90	30-137	2	30		
4,6-Dinitro-2-methylphenol	ug/kg	<44.8	2170	2170	431J	534J	20	25	30-133		30	M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2559151		2559152								
Parameter	Units	10384777001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits			
4-Bromophenylphenyl ether	ug/kg	<26.5	2170	2170	1920	1860	88	86	57-125	3	30	
4-Chloro-3-methylphenol	ug/kg	<32.4	2170	2170	1880	1870	86	86	53-125	0	30	
4-Chloroaniline	ug/kg	<74.7	2170	2170	1470	1560	68	72	30-125	6	30	
4-Chlorophenylphenyl ether	ug/kg	<25.2	2170	2170	1850	1790	85	82	60-125	3	30	
4-Nitroaniline	ug/kg	<49.3	2170	2170	1900	1880	88	87	30-140	1	30	
4-Nitrophenol	ug/kg	<48.5	2170	2170	1910	1900	88	87	30-150	1	30	
Acenaphthene	ug/kg	<21.6	2170	2170	1720	1670	79	77	56-125	3	30	
Acenaphthylene	ug/kg	<22.8	2170	2170	1850	1810	85	84	57-125	2	30	
Anthracene	ug/kg	<22.1	2170	2170	1930	1880	89	87	59-125	3	30	
Benzo(a)anthracene	ug/kg	<13.0	2170	2170	1950	1910	90	88	60-125	2	30	
Benzo(a)pyrene	ug/kg	<26.2	2170	2170	1970	1910	91	88	58-125	3	30	
Benzo(b)fluoranthene	ug/kg	<27.7	2170	2170	1940	1930	90	89	58-125	1	30	
Benzo(g,h,i)perylene	ug/kg	<52.0	2170	2170	1780	1740	82	80	30-138	3	30	
Benzo(k)fluoranthene	ug/kg	<24.7	2170	2170	1960	1910	90	88	55-125	2	30	
bis(2-Chloroethoxy)methane	ug/kg	<67.0	2170	2170	1710	1680	79	78	50-125	2	30	
bis(2-Chloroethyl) ether	ug/kg	<62.6	2170	2170	1740	1710	80	79	32-125	2	30	
bis(2-Chloroisopropyl) ether	ug/kg	<70.1	2170	2170	1710	1640	79	76	30-125	4	30	
bis(2-Ethylhexyl)phthalate	ug/kg	<54.8	2170	2170	2110	2110	97	97	30-147	0	30	
Butylbenzylphthalate	ug/kg	<52.7	2170	2170	2190	2180	101	101	30-149	0	30	
Carbazole	ug/kg	<24.1	2170	2170	1970	1910	91	88	56-125	3	30	
Chrysene	ug/kg	<13.0	2170	2170	1900	1860	88	86	60-125	2	30	
Di-n-butylphthalate	ug/kg	<25.0	2170	2170	2110	2060	97	95	30-143	3	30	
Di-n-octylphthalate	ug/kg	<50.0	2170	2170	2060	2060	95	95	59-125	0	30	
Dibenz(a,h)anthracene	ug/kg	<42.8	2170	2170	1820	1780	84	82	54-125	2	30	
Dibenzofuran	ug/kg	<16.8	2170	2170	1860	1810	86	84	57-125	3	30	
Diethylphthalate	ug/kg	<23.3	2170	2170	1950	1900	90	88	30-135	3	30	
Dimethylphthalate	ug/kg	<23.8	2170	2170	1930	1870	89	86	30-135	3	30	
Fluoranthene	ug/kg	<25.2	2170	2170	1950	1920	90	89	62-125	2	30	
Fluorene	ug/kg	<13.0	2170	2170	1870	1800	86	83	57-125	4	30	
Hexachloro-1,3-butadiene	ug/kg	<61.0	2170	2170	1580	1530	73	70	39-125	3	30	
Hexachlorobenzene	ug/kg	<23.2	2170	2170	1870	1820	86	84	56-125	3	30	
Hexachloroethane	ug/kg	<73.0	2170	2170	1520	1490	70	69	30-125	2	30	
Indeno(1,2,3-cd)pyrene	ug/kg	<22.1	2170	2170	1840	1780	85	82	30-137	3	30	
Isophorone	ug/kg	<50.6	2170	2170	1800	1760	83	81	52-125	2	30	
N-Nitroso-di-n-propylamine	ug/kg	<59.3	2170	2170	1880	1880	87	87	30-125	0	30	
N-Nitrosodimethylamine	ug/kg	<76.4	2170	2170	1810	1800	84	83	30-125	1	30	
N-Nitrosodiphenylamine	ug/kg	<22.6	2170	2170	1930	1900	89	88	58-125	2	30	
Naphthalene	ug/kg	<60.5	2170	2170	1650	1610	76	74	45-125	3	30	
Nitrobenzene	ug/kg	<78.5	2170	2170	1690	1660	78	77	45-125	1	30	
Pentachlorophenol	ug/kg	<46.1	2170	2170	1790	1740	83	80	30-144	3	30	
Phenanthrene	ug/kg	<23.4	2170	2170	1910	1890	88	87	59-125	1	30	
Phenol	ug/kg	<55.4	2170	2170	1810	1780	83	82	49-125	1	30	
Pyrene	ug/kg	<13.0	2170	2170	1950	1940	90	90	57-125	0	30	
2,4,6-Tribromophenol (S)	%						93	88	30-141			
2-Fluorobiphenyl (S)	%						83	80	30-130			
2-Fluorophenol (S)	%						84	80	30-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Parameter	Units	10384777001		2559151		2559152		% Rec	% Rec	% Rec	Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result						
Nitrobenzene-d5 (S)	%.							81	76		30-125		
p-Terphenyl-d14 (S)	%.							97	91		30-148		
Phenol-d6 (S)	%.							88	82		30-125		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 469214 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10384983001

METHOD BLANK: 2562273 Matrix: Water  
Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	04/19/17 11:32	

LABORATORY CONTROL SAMPLE & LCSD: 2562274 2562275

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	40.8	40.7	102	102	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2562276 2562277

Parameter	Units	10384430003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	445000 ug/L	40	40	487	513	104	168	80-120	5	30	M1

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

QC Batch: 469213

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10384983001

METHOD BLANK: 2562259

Matrix: Water

Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	04/18/17 18:28	

LABORATORY CONTROL SAMPLE: 2562260

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	934	93	80-120	

SAMPLE DUPLICATE: 2562261

Parameter	Units	10384983001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	220	221	0	10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 78765 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10384983001

METHOD BLANK: 333296 Matrix: Water  
Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	04/19/17 10:17	

LABORATORY CONTROL SAMPLE: 333297

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	109	90-110	

MATRIX SPIKE SAMPLE: 333299

Parameter	Units	2053323001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.13	65	75-125	M1

SAMPLE DUPLICATE: 333298

Parameter	Units	2053323001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 468745                      Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0            Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10384983001

METHOD BLANK: 2559964                      Matrix: Water  
Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	04/15/17 13:20	
Nitrate as N	mg/L	<0.013	0.10	0.013	04/15/17 13:20	
Sulfate	mg/L	<0.16	1.2	0.16	04/15/17 13:20	

LABORATORY CONTROL SAMPLE: 2559965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	12.8	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2559966                      2559967

Parameter	Units	10385469001		2559966		2559967		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	42.5	12.5	12.5	47.8	48.0	42	44	90-110	0	20	M1	
Nitrate as N	mg/L	0.21	1	1	1.1	1.1	90	91	90-110	1	20		
Sulfate	mg/L	383	12.5	12.5	327	329	-445	-431	90-110	1	20	E,M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

QC Batch: 111785 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10384983001

METHOD BLANK: 441634 Matrix: Water  
Associated Lab Samples: 10384983001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.24	1.0	0.24	04/25/17 15:36	

LABORATORY CONTROL SAMPLE: 441635

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	26.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 441636 441637

Parameter	Units	1286114001 Result	MS		MSD		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD % Rec						
Total Organic Carbon	mg/L	10.9	25	25	35.8	36.2	100	101	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 441638 441639

Parameter	Units	10385566001 Result	MS		MSD		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD % Rec						
Total Organic Carbon	mg/L	1.4	25	25	26.5	26.7	101	101	80-120	1	20	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10384983

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis  
PASI-N Pace Analytical Services - New Orleans  
PASI-V Pace Analytical Services - Virginia

### BATCH QUALIFIERS

Batch: 469076

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.  
E Analyte concentration exceeded the calibration range. The reported result is estimated.  
L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.  
R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV 5030 Med Level	Solid	SW-846 8260B	SW-846 5030B
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10384983

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10384983001	MW17D-GW-041317	RSK 175	469043		
10384983001	MW17D-GW-041317	EPA 3010	468736	EPA 6010C	469400
10384983003	MW17D-WC-041317	EPA 3050	468800	EPA 6020A	469107
10384983003	MW17D-WC-041317	EPA 3020	469096	EPA 6020A	469316
10384983003	MW17D-WC-041317	EPA 7470A	469097	EPA 7470A	469189
10384983001	MW17D-GW-041317	EPA 7470A	468738	EPA 7470A	469394
10384983003	MW17D-WC-041317	EPA 7471B	468818	EPA 7471B	468985
10384983003	MW17D-WC-041317	ASTM D2974	468716		
10384983003	MW17D-WC-041317	EPA 3550	468571	EPA 8270D	468978
10384983003	MW17D-WC-041317	EPA 5035/5030B	468949	EPA 8260B	469167
10384983004	TRIP2-041317	EPA 5035/5030B	468949	EPA 8260B	469167
10384983001	MW17D-GW-041317	EPA 8260B	469076		
10384983002	TRIP 1-041317	EPA 8260B	469076		
10384983001	MW17D-GW-041317	SM 2320B	469214		
10384983001	MW17D-GW-041317	SM 2540C	469213		
10384983001	MW17D-GW-041317	SM 4500-S-2 D	78765		
10384983001	MW17D-GW-041317	EPA 300.0	468745		
10384983001	MW17D-GW-041317	SM 5310C	111785		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2n.com  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day

## Section B Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #:  
 Project Name: UPRR\_Freeman  
 Project #: 1497

## Section C Invoice Information:

Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: CAS  
 Pace Quote:  
 Pace Project Manager:  
 Pace Profile #: 36447 / 6

Page: 1 Of 1  
 10384983  
 Regulatory Agency:  
 State / Location:  
 WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)															
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zinc Acetate	Na2S2O3	Methanol	Other				Analyses Test	Low Level VOCs by 8260	6010/7470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	800-499000	8220 + MAINTURE	CSIA of CTET (8260 Must be analyzed)			
1	MW17D-BW-041317	WT	G			4/13/17	1238	12	X	X	X	X	X						X	X	X	X	X	X	X												
2	TRIP1-041317	WT	G			4/13/17	0700	2				X							X																		
3	MW17D-WC-041317	SL	C			4/13/17	1440	6	X										X					X	X												
4	TRIP2-041317	-	-			4/13/17	0800	2											X					X													

001  
 3 DAY TAT 8260B; 10 day  
 002 All other analytes  
 5 DAY TAT All analytes  
 004

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold MW17D-BW-041317 VOCs = 3 day TAT; 10 day other Analytes MW17D-WC-041317 5 DAY TAT for All analytes	Ronald Melomb	4/13/17	1600	Uhr Pace	4-14-17	1220	3.6	Y	Y	Y

SAMPLER NAME AND SIGNATURE:  
 PRINT Name of SAMPLER: Ronald Melomb  
 SIGNATURE of SAMPLER: Ronald Melomb DATE Signed: 4/13/17



Document Name:  
**Sample Condition Upon Receipt Form - ESI**

Document No.:  
**F-MN-L-210-rev.22**

Document Revised: 21Dec2016  
 Page 1 of 2

Issuing Authority:  
 Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M Hill Project #: \_\_\_\_\_

**WO# : 10384983**

Optional: Proj. Due Date: \_\_\_\_\_ Proj. name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7862 3949 7791

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.4 Cooler Temp Corrected (°C): 3.6 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 10.2 Date and Initials of Person Examining Contents: 4-14-17 AA

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>4/14/17/15</u>	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1 11 11</u>
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1250</u>	Temp: <u>3.4</u>	Corrected Temp: <u>3.6</u>
Time: <u>1310</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_

Date: 04/14/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



# Chain of Custody

WO#: 2053261



Workorder: 10384983

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 4/14/2017

Results Requested By: 4/28/2017

Report To		Subcontract To					Requested Analysis																						
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other													LAB USE ONLY										
1	MW17D-GW-041317	PS	4/13/2017 12:38	10384983001	Water	1																							
2																													
3																													
4																													

Transfers					Comments											
Released By	Date/Time	Received By	Date/Time													
<i>[Signature]</i> Pace MN	4/14/17 1500	<i>[Signature]</i>	4/15/17 945													
REDEX	4/15/17 945	<i>[Signature]</i>	4/15/17 845													

Cooler Temperature on Receipt 13 °C      Custody Seal Y or N      Received on Ice Y or N      Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

WO#: 2053261



Sample Condition Upon Receipt

PM: ADC

Due Date: 04/28/17

CLIENT: PASI-MINN

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Project #. --

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 04-15-17 AB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Chain of Custody

**WO#: 1285830**

PH: CLJ      Due Date: 05/02/17

CLIENT: PACE MPLS

*lytical*  
celabs.com

Workorder: 10384983      Workorder Name: 1497 UPRR\_Freeman      Owner Received Date: 4/14/2017      Results Requested By: 4/28/2017

Report To		Subcontract To				Requested Analysis																			
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																							
						<u>Preserved Containers</u>																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other																			
1	MW17D-GW-041317	PS	4/13/2017 12:38	10384983001	Water	3																			
2																									
3																									
4																									
5																									
<b>Comments</b>																									
Transfers	Released By	Date/Time	Received By		Date/Time																				
1	<i>[Signature]</i> Pace MN	4/14/17 1500	<i>[Signature]</i>		4/17/17 1745																				
2		4/17/17 2130	<i>[Signature]</i>		4-18-17 0800																				
3																									
Cooler Temperature on Receipt <u>1.2</u> °C			Custody Seal <u>Y</u> or N			Received on Ice <u>Y</u> or N			Samples Intact <u>Y</u> or N																

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace-MIV

Project #

**WO# : 1285830**  
 PM: CLJ Due Date: 05/02/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: HOZPAC Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.9 Cooler Temp Corrected °C: 1.2 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: JPE 4/17/17

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Carrigan Date: 4/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

May 26, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

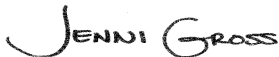
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: UST-078  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: MN00064  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8 Certification #: 8TMS-L  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Michigan Certification #: 9909

Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia WW Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842015-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC):  
E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC):  
T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10388373001	MW19D-GW-051017	Water	05/10/17 12:03	05/11/17 15:20
10388373002	Trip Blank-051017	Water	05/10/17 07:00	05/11/17 15:20

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10388373001	MW19D-GW-051017	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		EPA 8260B	PRD	83	PASI-M
		SM 2320B	JFP	2	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		SM 5310C	CRE	1	PASI-V
10388373002	Trip Blank-051017	EPA 8260B	PRD	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10388373001</b>	<b>MW19D-GW-051017</b>					
RSK 175	Methane	18.7	ug/L	10.0	05/13/17 09:43	
6010C Met	Barium, Dissolved	17.9	ug/L	10.0	05/17/17 19:09	
6010C Met	Calcium, Dissolved	46000	ug/L	500	05/17/17 19:09	
6010C Met	Cobalt, Dissolved	0.92J	ug/L	10.0	05/17/17 19:09	
6010C Met	Copper, Dissolved	1.0J	ug/L	10.0	05/17/17 19:09	
6010C Met	Lead, Dissolved	2.1J	ug/L	10.0	05/17/17 19:09	
6010C Met	Magnesium, Dissolved	17400	ug/L	500	05/17/17 19:09	
6010C Met	Manganese, Dissolved	32.8	ug/L	5.0	05/17/17 19:09	
6010C Met	Potassium, Dissolved	3830	ug/L	2500	05/17/17 19:09	
6010C Met	Sodium, Dissolved	16900	ug/L	1000	05/17/17 19:09	
6010C Met	Thallium, Dissolved	3.9J	ug/L	20.0	05/17/17 19:09	
6010C Met	Vanadium, Dissolved	4.6J	ug/L	15.0	05/17/17 19:09	
6010C Met	Zinc, Dissolved	5.4J	ug/L	20.0	05/17/17 19:09	
EPA 8260B	Acetone	11.8J	ug/L	20.0	05/17/17 17:28	CH,L1
EPA 8260B	Carbon disulfide	0.25J	ug/L	1.0	05/17/17 17:28	
EPA 8260B	Carbon tetrachloride	334	ug/L	2.5	05/19/17 16:11	
EPA 8260B	Chloroform	27.3	ug/L	1.0	05/17/17 17:28	
EPA 8260B	Methylene Chloride	0.48J	ug/L	4.0	05/17/17 17:28	
SM 2320B	Alkalinity,Bicarbonate (HCO3)	215	mg/L	5.0	05/19/17 14:56	
SM 2320B	Alkalinity, Total as CaCO3	176	mg/L	5.0	05/19/17 14:56	
SM 2540C	Total Dissolved Solids	283	mg/L	10.0	05/17/17 15:26	
EPA 300.0	Chloride	8.3	mg/L	1.2	05/12/17 10:32	
EPA 300.0	Nitrate as N	4.4	mg/L	0.10	05/12/17 10:32	
EPA 300.0	Sulfate	22.0	mg/L	1.2	05/12/17 10:32	
SM 5310C	Total Organic Carbon	1.4	mg/L	1.0	05/16/17 22:36	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

---

**Method:** EPA 8260B  
**Description:** 8260B MSV Low Level  
**Client:** UPRR\_CH2M Hill  
**Date:** May 26, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 474401

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2587501)
  - Acetone
- MS (Lab ID: 2587546)
  - Acetone
- MSD (Lab ID: 2587547)
  - Acetone
- MW19D-GW-051017 (Lab ID: 10388373001)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 474401

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

- LCS (Lab ID: 2587501)
  - Acetone
  - Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

QC Batch: 474401

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10388240002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2587546)
  - Acetone
- MSD (Lab ID: 2587547)
  - Acetone

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 80665

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2054631001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 342047)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 473625

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10388379003,10388379004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2583571)
  - Chloride
  - Sulfate
- MS (Lab ID: 2583573)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2583572)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2583574)
  - Chloride
  - Nitrate as N
  - Sulfate

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** May 26, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

**Sample: MW19D-GW-051017**      **Lab ID: 10388373001**      Collected: 05/10/17 12:03      Received: 05/11/17 15:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<0.87	ug/L	10.0	0.87	1		05/13/17 09:43	74-84-0	
Ethene	<0.77	ug/L	10.0	0.77	1		05/13/17 09:43	74-85-1	
Methane	18.7	ug/L	10.0	0.49	1		05/13/17 09:43	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	05/16/17 11:03	05/17/17 19:09	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	05/16/17 11:03	05/17/17 19:09	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	05/16/17 11:03	05/17/17 19:09	7440-38-2	
Barium, Dissolved	17.9	ug/L	10.0	0.20	1	05/16/17 11:03	05/17/17 19:09	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	05/16/17 11:03	05/17/17 19:09	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	05/16/17 11:03	05/17/17 19:09	7440-43-9	
Calcium, Dissolved	46000	ug/L	500	15.8	1	05/16/17 11:03	05/17/17 19:09	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	05/16/17 11:03	05/17/17 19:09	7440-47-3	
Cobalt, Dissolved	0.92J	ug/L	10.0	0.51	1	05/16/17 11:03	05/17/17 19:09	7440-48-4	
Copper, Dissolved	1.0J	ug/L	10.0	0.89	1	05/16/17 11:03	05/17/17 19:09	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	05/16/17 11:03	05/17/17 19:09	7439-89-6	
Lead, Dissolved	2.1J	ug/L	10.0	1.9	1	05/16/17 11:03	05/17/17 19:09	7439-92-1	
Magnesium, Dissolved	17400	ug/L	500	7.4	1	05/16/17 11:03	05/17/17 19:09	7439-95-4	
Manganese, Dissolved	32.8	ug/L	5.0	0.33	1	05/16/17 11:03	05/17/17 19:09	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	05/16/17 11:03	05/17/17 19:09	7440-02-0	
Potassium, Dissolved	3830	ug/L	2500	26.1	1	05/16/17 11:03	05/17/17 19:09	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	05/16/17 11:03	05/17/17 19:09	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	05/16/17 11:03	05/17/17 19:09	7440-22-4	
Sodium, Dissolved	16900	ug/L	1000	12.0	1	05/16/17 11:03	05/17/17 19:09	7440-23-5	
Thallium, Dissolved	3.9J	ug/L	20.0	3.8	1	05/16/17 11:03	05/17/17 19:09	7440-28-0	
Vanadium, Dissolved	4.6J	ug/L	15.0	0.39	1	05/16/17 11:03	05/17/17 19:09	7440-62-2	
Zinc, Dissolved	5.4J	ug/L	20.0	1.4	1	05/16/17 11:03	05/17/17 19:09	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.031	ug/L	0.20	0.031	1	05/17/17 09:54	05/17/17 17:14	7439-97-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		05/17/17 17:28	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		05/17/17 17:28	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		05/17/17 17:28	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		05/17/17 17:28	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		05/17/17 17:28	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		05/17/17 17:28	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		05/17/17 17:28	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		05/17/17 17:28	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		05/17/17 17:28	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		05/17/17 17:28	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		05/17/17 17:28	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		05/17/17 17:28	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	10.0	0.60	1		05/17/17 17:28	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		05/17/17 17:28	106-93-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Sample: MW19D-GW-051017 Lab ID: 10388373001 Collected: 05/10/17 12:03 Received: 05/11/17 15:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		05/17/17 17:28	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		05/17/17 17:28	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		05/17/17 17:28	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		05/17/17 17:28	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		05/17/17 17:28	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		05/17/17 17:28	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		05/17/17 17:28	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		05/17/17 17:28	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		05/17/17 17:28	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		05/17/17 17:28	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		05/17/17 17:28	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		05/17/17 17:28	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		05/17/17 17:28	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		05/17/17 17:28	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		05/17/17 17:28	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		05/17/17 17:28	108-10-1	
Acetone	11.8J	ug/L	20.0	0.64	1		05/17/17 17:28	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		05/17/17 17:28	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		05/17/17 17:28	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		05/17/17 17:28	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		05/17/17 17:28	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		05/17/17 17:28	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		05/17/17 17:28	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		05/17/17 17:28	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		05/17/17 17:28	74-83-9	
Carbon disulfide	0.25J	ug/L	1.0	0.20	1		05/17/17 17:28	75-15-0	
Carbon tetrachloride	334	ug/L	2.5	0.40	5		05/19/17 16:11	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		05/17/17 17:28	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		05/17/17 17:28	75-00-3	
Chloroform	27.3	ug/L	1.0	0.21	1		05/17/17 17:28	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		05/17/17 17:28	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		05/17/17 17:28	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		05/17/17 17:28	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		05/17/17 17:28	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		05/17/17 17:28	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		05/17/17 17:28	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		05/17/17 17:28	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		05/17/17 17:28	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		05/17/17 17:28	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		05/17/17 17:28	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		05/17/17 17:28	1634-04-4	
Methylene Chloride	0.48J	ug/L	4.0	0.097	1		05/17/17 17:28	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		05/17/17 17:28	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		05/17/17 17:28	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		05/17/17 17:28	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		05/17/17 17:28	109-99-9	L3

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

**Sample: MW19D-GW-051017**      **Lab ID: 10388373001**      Collected: 05/10/17 12:03      Received: 05/11/17 15:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<0.059	ug/L	0.50	0.059	1		05/17/17 17:28	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		05/17/17 17:28	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		05/17/17 17:28	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		05/17/17 17:28	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		05/17/17 17:28	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		05/17/17 17:28	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		05/17/17 17:28	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		05/17/17 17:28	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		05/17/17 17:28	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		05/17/17 17:28	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		05/17/17 17:28	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		05/17/17 17:28	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		05/17/17 17:28	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		05/17/17 17:28	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		05/17/17 17:28	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		05/17/17 17:28	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		05/17/17 17:28	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		05/17/17 17:28	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		05/17/17 17:28	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		05/17/17 17:28	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		05/17/17 17:28	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		05/17/17 17:28	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		05/17/17 17:28	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity,Bicarbonate (HCO3)	<b>215</b>	mg/L	5.0	1.4	1		05/19/17 14:56		
Alkalinity, Total as CaCO3	<b>176</b>	mg/L	5.0	1.4	1		05/19/17 14:56		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>283</b>	mg/L	10.0	5.0	1		05/17/17 15:26		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		05/17/17 10:50	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.3</b>	mg/L	1.2	0.10	1		05/12/17 10:32	16887-00-6	
Nitrate as N	<b>4.4</b>	mg/L	0.10	0.013	1		05/12/17 10:32	14797-55-8	
Sulfate	<b>22.0</b>	mg/L	1.2	0.16	1		05/12/17 10:32	14808-79-8	
<b>5310C TOC</b>		Analytical Method: SM 5310C							
Total Organic Carbon	<b>1.4</b>	mg/L	1.0	0.20	1		05/16/17 22:36	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Sample: Trip Blank-051017 Lab ID: 10388373002 Collected: 05/10/17 07:00 Received: 05/11/17 15:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		05/17/17 12:22	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		05/17/17 12:22	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		05/17/17 12:22	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		05/17/17 12:22	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		05/17/17 12:22	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		05/17/17 12:22	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		05/17/17 12:22	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		05/17/17 12:22	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		05/17/17 12:22	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		05/17/17 12:22	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		05/17/17 12:22	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		05/17/17 12:22	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	10.0	0.60	1		05/17/17 12:22	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		05/17/17 12:22	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		05/17/17 12:22	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		05/17/17 12:22	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		05/17/17 12:22	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		05/17/17 12:22	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		05/17/17 12:22	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		05/17/17 12:22	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		05/17/17 12:22	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		05/17/17 12:22	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		05/17/17 12:22	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		05/17/17 12:22	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		05/17/17 12:22	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		05/17/17 12:22	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		05/17/17 12:22	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		05/17/17 12:22	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		05/17/17 12:22	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		05/17/17 12:22	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		05/17/17 12:22	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		05/17/17 12:22	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		05/17/17 12:22	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		05/17/17 12:22	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		05/17/17 12:22	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		05/17/17 12:22	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		05/17/17 12:22	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		05/17/17 12:22	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		05/17/17 12:22	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		05/17/17 12:22	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		05/17/17 12:22	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		05/17/17 12:22	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		05/17/17 12:22	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		05/17/17 12:22	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		05/17/17 12:22	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		05/17/17 12:22	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Sample: Trip Blank-051017 Lab ID: 10388373002 Collected: 05/10/17 07:00 Received: 05/11/17 15:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		05/17/17 12:22	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		05/17/17 12:22	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		05/17/17 12:22	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		05/17/17 12:22	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		05/17/17 12:22	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		05/17/17 12:22	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		05/17/17 12:22	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		05/17/17 12:22	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		05/17/17 12:22	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		05/17/17 12:22	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		05/17/17 12:22	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		05/17/17 12:22	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		05/17/17 12:22	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		05/17/17 12:22	109-99-9	L3
Toluene	<0.059	ug/L	0.50	0.059	1		05/17/17 12:22	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		05/17/17 12:22	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		05/17/17 12:22	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		05/17/17 12:22	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		05/17/17 12:22	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		05/17/17 12:22	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		05/17/17 12:22	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		05/17/17 12:22	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		05/17/17 12:22	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		05/17/17 12:22	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		05/17/17 12:22	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		05/17/17 12:22	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		05/17/17 12:22	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		05/17/17 12:22	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		05/17/17 12:22	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		05/17/17 12:22	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		05/17/17 12:22	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		05/17/17 12:22	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		05/17/17 12:22	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		05/17/17 12:22	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		05/17/17 12:22	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		05/17/17 12:22	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		05/17/17 12:22	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 473750 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10388373001

METHOD BLANK: 2584643 Matrix: Water  
Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<0.87	10.0	0.87	05/13/17 07:37	
Ethene	ug/L	<0.77	10.0	0.77	05/13/17 07:37	
Methane	ug/L	1.5J	10.0	0.49	05/13/17 07:37	

LABORATORY CONTROL SAMPLE & LCSD: 2584644

Parameter	Units	2584645								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	106	108	93	95	85-115	1	20	
Ethene	ug/L	106	99.8	101	94	95	85-115	1	20	
Methane	ug/L	60.7	56.1	57.2	92	94	85-115	2	20	

SAMPLE DUPLICATE: 2584646

Parameter	Units	50170836001		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<0.87		20	
Ethene	ug/L	ND	<0.77		20	
Methane	ug/L	ND	1.5J		20	

SAMPLE DUPLICATE: 2584647

Parameter	Units	10388209005		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<0.87		20	
Ethene	ug/L	ND	<0.77		20	
Methane	ug/L	ND	5.4J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

QC Batch: 474213

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10388373001

METHOD BLANK: 2586311

Matrix: Water

Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.031	0.20	0.031	05/17/17 16:46	

LABORATORY CONTROL SAMPLE: 2586312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2586313 2586314

Parameter	Units	10388141001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	ND	5	5	4.8	4.5	96	90	80-120	6	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 473984 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10388373001

METHOD BLANK: 2585519 Matrix: Water  
Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	05/17/17 18:15	
Antimony, Dissolved	ug/L	6.0J	20.0	2.5	05/17/17 18:15	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	05/17/17 18:15	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	05/17/17 18:15	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	05/17/17 18:15	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	05/17/17 18:15	
Calcium, Dissolved	ug/L	<15.8	500	15.8	05/17/17 18:15	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	05/17/17 18:15	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	05/17/17 18:15	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	05/17/17 18:15	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	05/17/17 18:15	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	05/17/17 18:15	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	05/17/17 18:15	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	05/17/17 18:15	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	05/17/17 18:15	
Potassium, Dissolved	ug/L	27.3J	2500	26.1	05/17/17 18:15	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	05/17/17 18:15	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	05/17/17 18:15	
Sodium, Dissolved	ug/L	378J	1000	12.0	05/17/17 18:15	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	05/17/17 18:15	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	05/17/17 18:15	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	05/17/17 18:15	

LABORATORY CONTROL SAMPLE: 2585520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	104	80-120	
Antimony, Dissolved	ug/L	1000	1000	100	80-120	
Arsenic, Dissolved	ug/L	1000	1030	103	80-120	
Barium, Dissolved	ug/L	1000	1020	102	80-120	
Beryllium, Dissolved	ug/L	1000	1050	105	80-120	
Cadmium, Dissolved	ug/L	1000	1020	102	80-120	
Calcium, Dissolved	ug/L	20000	19700	99	80-120	
Chromium, Dissolved	ug/L	1000	1000	100	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	969	97	80-120	
Iron, Dissolved	ug/L	20000	20400	102	80-120	
Lead, Dissolved	ug/L	1000	1010	101	80-120	
Magnesium, Dissolved	ug/L	20000	20200	101	80-120	
Manganese, Dissolved	ug/L	1000	1020	102	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

LABORATORY CONTROL SAMPLE: 2585520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20100	101	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	497	99	80-120	
Sodium, Dissolved	ug/L	20000	20300	102	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	980	98	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2585521 2585522

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10388141001 Result	Spike Conc.	Spike Conc.	MS Result							
Aluminum, Dissolved	ug/L	ND	20000	20000	20800	20900	104	104	75-125	0	20	
Antimony, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	75-125	0	20	
Arsenic, Dissolved	ug/L	ND	1000	1000	1040	1050	104	104	75-125	0	20	
Barium, Dissolved	ug/L	65.5	1000	1000	1080	1080	101	102	75-125	0	20	
Beryllium, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	75-125	0	20	
Cadmium, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	75-125	0	20	
Calcium, Dissolved	ug/L	24500	20000	20000	44800	44800	101	101	75-125	0	20	
Chromium, Dissolved	ug/L	ND	1000	1000	1010	1010	100	100	75-125	0	20	
Cobalt, Dissolved	ug/L	ND	1000	1000	1010	1010	101	100	75-125	0	20	
Copper, Dissolved	ug/L	ND	1000	1000	978	981	98	98	75-125	0	20	
Iron, Dissolved	ug/L	85.7	20000	20000	20400	20400	102	101	75-125	0	20	
Lead, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	75-125	0	20	
Magnesium, Dissolved	ug/L	6980	20000	20000	27300	27400	102	102	75-125	0	20	
Manganese, Dissolved	ug/L	ND	1000	1000	1020	1030	102	102	75-125	0	20	
Nickel, Dissolved	ug/L	ND	1000	1000	1020	1020	101	101	75-125	0	20	
Potassium, Dissolved	ug/L	10200	20000	20000	30800	30800	103	103	75-125	0	20	
Selenium, Dissolved	ug/L	ND	1000	1000	1050	1040	105	104	75-125	0	20	
Silver, Dissolved	ug/L	ND	500	500	498	499	100	100	75-125	0	20	
Sodium, Dissolved	ug/L	4900	20000	20000	25400	25600	102	103	75-125	1	20	
Thallium, Dissolved	ug/L	ND	1000	1000	1020	1020	101	101	75-125	0	20	
Vanadium, Dissolved	ug/L	ND	1000	1000	984	985	98	98	75-125	0	20	
Zinc, Dissolved	ug/L	ND	1000	1000	1020	1010	101	101	75-125	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 474401 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10388373001, 10388373002

METHOD BLANK: 2587500 Matrix: Water  
Associated Lab Samples: 10388373001, 10388373002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	05/17/17 10:54	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	05/17/17 10:54	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	05/17/17 10:54	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	05/17/17 10:54	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	05/17/17 10:54	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	05/17/17 10:54	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	05/17/17 10:54	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	05/17/17 10:54	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	05/17/17 10:54	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	05/17/17 10:54	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	05/17/17 10:54	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	05/17/17 10:54	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	10.0	0.60	05/17/17 10:54	MN
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	05/17/17 10:54	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	05/17/17 10:54	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	05/17/17 10:54	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	05/17/17 10:54	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	05/17/17 10:54	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	05/17/17 10:54	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	05/17/17 10:54	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	05/17/17 10:54	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	05/17/17 10:54	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	05/17/17 10:54	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	05/17/17 10:54	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	05/17/17 10:54	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	05/17/17 10:54	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	05/17/17 10:54	
2-Hexanone	ug/L	<0.19	5.0	0.19	05/17/17 10:54	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	05/17/17 10:54	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	05/17/17 10:54	
Acetone	ug/L	<0.64	20.0	0.64	05/17/17 10:54	
Acrolein	ug/L	<2.1	10.0	2.1	05/17/17 10:54	
Acrylonitrile	ug/L	<0.49	10.0	0.49	05/17/17 10:54	
Benzene	ug/L	<0.042	0.50	0.042	05/17/17 10:54	
Bromobenzene	ug/L	<0.087	0.50	0.087	05/17/17 10:54	
Bromochloromethane	ug/L	<0.082	1.0	0.082	05/17/17 10:54	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	05/17/17 10:54	
Bromoform	ug/L	<0.11	4.0	0.11	05/17/17 10:54	
Bromomethane	ug/L	<0.20	4.0	0.20	05/17/17 10:54	
Carbon disulfide	ug/L	<0.20	1.0	0.20	05/17/17 10:54	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	05/17/17 10:54	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

METHOD BLANK: 2587500

Matrix: Water

Associated Lab Samples: 10388373001, 10388373002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	05/17/17 10:54	
Chloroethane	ug/L	<0.12	1.0	0.12	05/17/17 10:54	
Chloroform	ug/L	<0.21	1.0	0.21	05/17/17 10:54	
Chloromethane	ug/L	<0.080	4.0	0.080	05/17/17 10:54	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	05/17/17 10:54	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	05/17/17 10:54	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	05/17/17 10:54	
Dibromomethane	ug/L	<0.14	1.0	0.14	05/17/17 10:54	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	05/17/17 10:54	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	05/17/17 10:54	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	05/17/17 10:54	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	05/17/17 10:54	
Ethylbenzene	ug/L	<0.075	0.50	0.075	05/17/17 10:54	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	05/17/17 10:54	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	05/17/17 10:54	
m&p-Xylene	ug/L	<0.11	1.0	0.11	05/17/17 10:54	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	05/17/17 10:54	
Methylene Chloride	ug/L	<0.097	4.0	0.097	05/17/17 10:54	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	05/17/17 10:54	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	05/17/17 10:54	
Naphthalene	ug/L	<0.064	1.0	0.064	05/17/17 10:54	
o-Xylene	ug/L	<0.044	0.50	0.044	05/17/17 10:54	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	05/17/17 10:54	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	05/17/17 10:54	
Styrene	ug/L	<0.056	0.50	0.056	05/17/17 10:54	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	05/17/17 10:54	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	05/17/17 10:54	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	05/17/17 10:54	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	05/17/17 10:54	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	05/17/17 10:54	
Toluene	ug/L	<0.059	0.50	0.059	05/17/17 10:54	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	05/17/17 10:54	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	05/17/17 10:54	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	05/17/17 10:54	
Trichloroethene	ug/L	<0.044	0.40	0.044	05/17/17 10:54	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	05/17/17 10:54	
Vinyl acetate	ug/L	<0.12	10.0	0.12	05/17/17 10:54	
Vinyl chloride	ug/L	<0.098	0.20	0.098	05/17/17 10:54	
Xylene (Total)	ug/L	<0.15	1.5	0.15	05/17/17 10:54	
1,2-Dichloroethane-d4 (S)	%	101	75-137		05/17/17 10:54	
4-Bromofluorobenzene (S)	%	101	75-125		05/17/17 10:54	
Toluene-d8 (S)	%	101	75-125		05/17/17 10:54	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

LABORATORY CONTROL SAMPLE: 2587501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.8	114	75-136	
1,1,1-Trichloroethane	ug/L	20	21.3	107	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	21.1	105	71-138	
1,1,2-Trichloroethane	ug/L	20	21.8	109	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.8	109	69-126	
1,1-Dichloroethane	ug/L	20	21.0	105	75-125	
1,1-Dichloroethene	ug/L	20	21.8	109	75-125	
1,1-Dichloropropene	ug/L	20	21.4	107	75-125	
1,2,3-Trichlorobenzene	ug/L	20	21.3	107	75-125	
1,2,3-Trichloropropane	ug/L	20	21.1	106	75-125	
1,2,4-Trichlorobenzene	ug/L	20	23.1	115	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.9	100	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	46.5	93	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.7	108	75-125	
1,2-Dichlorobenzene	ug/L	20	20.5	103	75-125	
1,2-Dichloroethane	ug/L	20	20.6	103	70-125	
1,2-Dichloroethene (Total)	ug/L	40	41.8	104	75-125	
1,2-Dichloropropane	ug/L	20	20.8	104	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.1	100	75-125	
1,3-Dichloropropane	ug/L	20	21.6	108	75-125	
1,4-Dichlorobenzene	ug/L	20	19.8	99	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	417	104	64-140	
2,2,4-Trimethylpentane	ug/L	20	22.3	112	68-125	
2,2-Dichloropropane	ug/L	20	22.6	113	70-131	
2-Butanone (MEK)	ug/L	100	96.6	97	69-125	
2-Chlorotoluene	ug/L	20	19.3	97	75-125	
2-Hexanone	ug/L	100	102	102	73-129	
4-Chlorotoluene	ug/L	20	19.7	99	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	102	102	73-125	
Acetone	ug/L	100	151	151	66-126	CH,L1
Acrolein	ug/L	200	222	111	56-150	
Acrylonitrile	ug/L	200	202	101	68-129	
Benzene	ug/L	20	20.1	101	75-125	
Bromobenzene	ug/L	20	20.2	101	75-125	
Bromochloromethane	ug/L	20	22.3	112	75-126	
Bromodichloromethane	ug/L	20	21.8	109	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	21.6	108	34-143	
Carbon disulfide	ug/L	20	21.1	105	71-125	
Carbon tetrachloride	ug/L	20	21.5	107	71-145	
Chlorobenzene	ug/L	20	20.3	101	75-125	
Chloroethane	ug/L	20	21.4	107	75-125	
Chloroform	ug/L	20	20.2	101	75-125	
Chloromethane	ug/L	20	20.6	103	54-125	
cis-1,2-Dichloroethene	ug/L	20	21.0	105	75-125	
cis-1,3-Dichloropropene	ug/L	20	21.3	107	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

LABORATORY CONTROL SAMPLE: 2587501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	22.3	111	74-141	
Dibromomethane	ug/L	20	21.8	109	75-125	
Dichlorodifluoromethane	ug/L	20	20.9	105	59-130	
Dichlorofluoromethane	ug/L	20	21.7	109	75-125	
Diisopropyl ether	ug/L	20	20.8	104	69-125	
Ethyl-tert-butyl ether	ug/L	20	21.7	109	73-125	
Ethylbenzene	ug/L	20	19.1	96	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.5	107	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.9	100	75-125	
m&p-Xylene	ug/L	40	40.8	102	75-125	
Methyl-tert-butyl ether	ug/L	20	21.5	107	75-125	
Methylene Chloride	ug/L	20	21.1	105	73-125	
n-Butylbenzene	ug/L	20	20.9	105	75-125	
n-Propylbenzene	ug/L	20	19.5	97	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	20.2	101	75-125	
p-Isopropyltoluene	ug/L	20	19.7	99	75-125	
sec-Butylbenzene	ug/L	20	19.8	99	75-125	
Styrene	ug/L	20	21.8	109	75-125	
tert-Amylmethyl ether	ug/L	20	20.9	105	71-126	
tert-Butyl Alcohol	ug/L	200	204	102	69-131	
tert-Butylbenzene	ug/L	20	19.3	96	75-125	
Tetrachloroethene	ug/L	20	20.0	100	75-125	
Tetrahydrofuran	ug/L	200	262	131	65-127 L1	
Toluene	ug/L	20	20.0	100	75-125	
trans-1,2-Dichloroethene	ug/L	20	20.8	104	75-125	
trans-1,3-Dichloropropene	ug/L	20	24.1	120	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	56.2	112	30-150	
Trichloroethene	ug/L	20	20.2	101	75-125	
Trichlorofluoromethane	ug/L	20	21.5	107	71-140	
Vinyl acetate	ug/L	20	21.2	106	68-137	
Vinyl chloride	ug/L	20	22.2	111	70-125	
Xylene (Total)	ug/L	60	61.1	102	75-125	
1,2-Dichloroethane-d4 (S)	%			99	75-137	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2587546 2587547

Parameter	Units	2587546		2587547		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	21.3	22.6	107	113	75-137	6	30
1,1,1-Trichloroethane	ug/L	<0.057	20	20	22.1	22.8	110	114	75-139	3	30
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	19.3	20.6	97	103	60-142	7	30
1,1,2-Trichloroethane	ug/L	<0.064	20	20	19.3	20.8	97	104	75-128	7	30

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2587546		2587547									
Parameter	Units	10388240002	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	25.7	26.1	129	130	62-150	1	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	20.7	21.3	104	106	70-129	3	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	23.2	23.6	116	118	67-141	2	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	22.5	22.5	112	112	64-144	0	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	20.8	21.4	104	107	66-139	3	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	18.5	19.9	93	99	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	22.3	22.7	112	114	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	19.5	20.1	98	100	65-143	3	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	42.7	44.6	85	89	61-134	4	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	18.8	19.7	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	19.1	20.0	95	100	68-135	4	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	18.8	19.2	94	96	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	41.7	42.9	104	107	69-134	3	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	20.0	20.7	100	104	64-130	3	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	19.7	19.9	99	100	64-146	1	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	18.9	19.8	95	99	69-135	5	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.2	20.0	96	100	67-128	4	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	18.5	18.9	92	95	66-134	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	413	410	103	102	58-140	1	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	28.7	27.6	143	138	48-150	4	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	23.5	23.9	118	120	50-150	2	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	84.4	88.5	84	89	58-125	5	30		
2-Chlorotoluene	ug/L	<0.084	20	20	19.0	19.7	95	98	65-138	4	30		
2-Hexanone	ug/L	<0.19	100	100	92.3	99.1	92	99	61-134	7	30		
4-Chlorotoluene	ug/L	<0.048	20	20	18.9	19.6	95	98	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	91.3	97.6	91	98	61-130	7	30		
Acetone	ug/L	<0.64	100	100	142	148	142	148	51-140	4	30	CH <sub>3</sub> MO	
Acrolein	ug/L	<2.1	200	200	263	273	132	136	48-150	4	30		
Acrylonitrile	ug/L	<0.49	200	200	174	181	87	91	55-134	4	30		
Benzene	ug/L	<0.042	20	20	19.9	20.4	100	102	63-132	2	30		
Bromobenzene	ug/L	<0.087	20	20	18.6	19.6	93	98	67-138	5	30		
Bromochloromethane	ug/L	<0.082	20	20	20.7	21.2	104	106	66-138	2	30		
Bromodichloromethane	ug/L	<0.068	20	20	20.3	21.3	102	107	75-137	5	30		
Bromoform	ug/L	<0.11	20	20	18.0	19.1	90	96	65-129	6	30		
Bromomethane	ug/L	<0.20	20	20	21.5	23.8	107	119	41-150	10	30		
Carbon disulfide	ug/L	<0.20	20	20	22.6	22.5	113	112	72-132	1	30		
Carbon tetrachloride	ug/L	<0.079	20	20	22.7	23.4	114	117	75-150	3	30		
Chlorobenzene	ug/L	<0.066	20	20	19.1	19.8	95	99	73-127	3	30		
Chloroethane	ug/L	<0.12	20	20	21.2	23.0	106	115	74-138	8	30		
Chloroform	ug/L	<0.21	20	20	19.4	20.0	97	100	74-125	3	30		
Chloromethane	ug/L	<0.080	20	20	20.5	22.2	103	111	58-129	8	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	20.4	21.1	102	106	63-135	4	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.5	20.4	97	102	66-129	5	30		
Dibromochloromethane	ug/L	<0.048	20	20	20.5	21.4	103	107	75-133	4	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

Parameter	Units	2587546		2587547		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10388240002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.14	20	20	19.4	20.3	97	102	68-134	5	30	
Dichlorodifluoromethane	ug/L	<0.075	20	20	24.2	26.2	121	131	72-150	8	30	
Dichlorofluoromethane	ug/L	<0.054	20	20	21.2	23.2	106	116	75-129	9	30	
Diisopropyl ether	ug/L	<0.050	20	20	19.2	19.8	96	99	62-128	3	30	
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	19.4	20.0	97	100	63-132	3	30	
Ethylbenzene	ug/L	<0.075	20	20	18.9	19.7	95	99	72-130	4	30	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	23.9	23.4	119	117	71-150	2	30	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	19.7	21.0	98	105	70-136	6	30	
m&p-Xylene	ug/L	<0.11	40	40	39.7	41.9	99	105	64-142	5	30	
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.1	19.9	96	100	72-125	4	30	
Methylene Chloride	ug/L	<0.097	20	20	19.6	19.6	98	98	60-132	0	30	
n-Butylbenzene	ug/L	<0.16	20	20	22.2	22.4	111	112	60-150	1	30	
n-Propylbenzene	ug/L	<0.049	20	20	19.7	20.2	99	101	63-142	3	30	
Naphthalene	ug/L	<0.064	20	20	19.3	20.3	97	101	67-125	5	30	
o-Xylene	ug/L	<0.044	20	20	19.3	20.4	96	102	60-143	6	30	
p-Isopropyltoluene	ug/L	<0.064	20	20	20.5	20.7	103	103	64-146	1	30	
sec-Butylbenzene	ug/L	<0.094	20	20	20.8	21.3	104	107	67-144	2	30	
Styrene	ug/L	<0.056	20	20	20.3	21.1	101	106	67-136	4	30	
tert-Amylmethyl ether	ug/L	<0.073	20	20	18.6	19.3	93	96	60-134	3	30	
tert-Butyl Alcohol	ug/L	<0.89	200	200	203	217	102	108	56-146	7	30	
tert-Butylbenzene	ug/L	<0.051	20	20	19.8	20.1	99	100	68-135	2	30	
Tetrachloroethene	ug/L	<0.13	20	20	20.4	21.4	102	107	67-148	5	30	
Tetrahydrofuran	ug/L	<1.5	200	200	263	272	131	136	51-141	3	30	
Toluene	ug/L	<0.059	20	20	19.9	20.4	99	102	61-140	3	30	
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	21.3	21.7	106	109	62-138	2	30	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	21.2	22.1	106	110	67-134	4	30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	50.2	52.3	100	105	30-150	4	30	
Trichloroethene	ug/L	<0.044	20	20	19.9	20.7	99	104	64-149	4	30	
Trichlorofluoromethane	ug/L	<0.055	20	20	23.8	25.9	119	130	75-150	9	30	
Vinyl acetate	ug/L	<0.12	20	20	20.1	21.3	101	107	49-143	6	30	
Vinyl chloride	ug/L	<0.098	20	20	23.0	25.3	115	126	75-133	9	30	
Xylene (Total)	ug/L	<0.15	60	60	58.9	62.3	98	104	63-142	5	30	
1,2-Dichloroethane-d4 (S)	%						99	98	75-137			
4-Bromofluorobenzene (S)	%						101	99	75-125			
Toluene-d8 (S)	%						102	101	75-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 474897 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10388373001

METHOD BLANK: 2590027 Matrix: Water  
Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	05/19/17 12:52	

LABORATORY CONTROL SAMPLE & LCSD: 2590028 2590029

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	41.9	42.0	105	105	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2590030 2590031

Parameter	Units	10388314007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	238	40	40	281	280	108	105	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2590032 2590033

Parameter	Units	10388373001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	176	40	40	219	218	108	105	80-120	1	30	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 474390 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10388373001

METHOD BLANK: 2587457 Matrix: Water  
Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	05/17/17 15:26	

LABORATORY CONTROL SAMPLE: 2587458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	916	92	80-120	

SAMPLE DUPLICATE: 2587459

Parameter	Units	10388371001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	510	519	2	10	

SAMPLE DUPLICATE: 2587460

Parameter	Units	10388373001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	283	277	2	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

QC Batch: 80665

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10388373001

METHOD BLANK: 342044

Matrix: Water

Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	05/17/17 10:40	

LABORATORY CONTROL SAMPLE: 342045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	95	90-110	

MATRIX SPIKE SAMPLE: 342047

Parameter	Units	2054631001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	0.021	.2	0.15	66	75-125	M1

SAMPLE DUPLICATE: 342046

Parameter	Units	2054631001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	0.021	0.019J		20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 473625 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10388373001

METHOD BLANK: 2583569 Matrix: Water  
Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	05/12/17 10:47	
Nitrate as N	mg/L	<0.013	0.10	0.013	05/12/17 10:47	
Sulfate	mg/L	<0.16	1.2	0.16	05/12/17 10:47	

LABORATORY CONTROL SAMPLE: 2583570

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	12.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2583571 2583572

Parameter	Units	10388379003		2583572		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	412	62.5	62.5	445	447	53	57	90-110	1	20	M1	
Sulfate	mg/L	25.0	12.5	12.5	33.9	33.9	72	72	90-110	0	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2583573 2583574

Parameter	Units	10388379004		2583574		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	40.0	12.5	12.5	46.4	46.6	51	53	90-110	1	20	M1	
Nitrate as N	mg/L	3.0	1	1	3.5	3.5	48	48	90-110	0	20	M1	
Sulfate	mg/L	45.1	12.5	12.5	50.9	51.3	46	49	90-110	1	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10388373

QC Batch: 113877 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10388373001

METHOD BLANK: 449178 Matrix: Water  
Associated Lab Samples: 10388373001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	05/16/17 16:40	

LABORATORY CONTROL SAMPLE: 449179

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.4	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 449180 449181

Parameter	Units	10388710001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Total Organic Carbon	mg/L	7.4	25	25	33.0	33.1	102	103	80-120	0	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 449182 449183

Parameter	Units	10388022005 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Total Organic Carbon	mg/L	4.5	25	25	30.2	30.5	103	104	80-120	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10388373

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10388373001	MW19D-GW-051017	RSK 175	473750		
10388373001	MW19D-GW-051017	EPA 3010	473984	6010C Met	474272
10388373001	MW19D-GW-051017	EPA 7470A	474213	EPA 7470A	474571
10388373001	MW19D-GW-051017	EPA 8260B	474401		
10388373002	Trip Blank-051017	EPA 8260B	474401		
10388373001	MW19D-GW-051017	SM 2320B	474897		
10388373001	MW19D-GW-051017	SM 2540C	474390		
10388373001	MW19D-GW-051017	SM 4500-S-2 D	80665		
10388373001	MW19D-GW-051017	EPA 300.0	473625		
10388373001	MW19D-GW-051017	SM 5310C	113877		

### REPORT OF LABORATORY ANALYSIS

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

0398373

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: CH2M Hill	Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Report To: Mark Ochsner, Brad Ostapkowicz	Copy To: Steve Demus	Attention: Gary Honeyman	Company Name: UPRR
Email: mark.Ochsner@ch2h.com	Phone: [ ] Fax: [ ]	Purchase Order #:	Project Name: UPRR_Freeman	Address:	Pace Quote: Contract# 758938
Requested Due Date/Circle: 24 Hour / 5 Day / <u>10 Day</u>			Project #: 1497	Pace Project Manager: Jennifer Gross	Pace Profile #: 36447
					<b>Regulatory Agency</b>
					<b>State / Location</b>
					<b>WA / Freeman</b>

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	PRESERVATIVES											REQUESTED ANALYSIS FILTERED (Y/N)											Residual Chlorine (Y/N)
				START		END			# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Ac2	Na2S2O3	Methanol	Other	Analyses Test	Y/N												
				DATE	TIME	DATE	TIME													VOCs by 8260	Low Level	Dry-Weight Metals (28)	Mercury	Alkalinity 2309/515.1	Ammonia 300.0	TDSS 514.25/106	TOC 406R13/415.2	Sulfide 376.2	RSK 125		
1	MW19D-GW-051017	WT	G			5/10/17	1203	12	X	X	X	X						X	X	X	X	X	X	X	X	X	X	001			
2	Trip Blank - 051017	WT	G			5/10/17	0700											X										Trip Blank 002			
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
VOCs Low Level J-flags	ZKB/CH2M	5/10/17	1520	[Signature]	5/11/17	1526	3.8	Y	Y	Y

<b>SAMPLER NAME AND SIGNATURE</b>		TEMP in C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: L. Bayman					
SIGNATURE of SAMPLER: [Signature]					
DATE Signed: 5-10-17					



Document Name:  
**Sample Condition Upon Receipt Form - ESI**

Document No.:  
**F-MN-L-210-rev.22**

Document Revised: 21Dec2016  
Page 1 of 2

Issuing Authority:  
Pace Minnesota Quality Office

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name: CH2M HILL

Project #:

**WO#: 10388373**

10388373

Optional: Proj. Due Date: Proj. Name:

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other:

Tracking Number: 722 2737 8530

Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other:  
 Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.8 Cooler Temp Corrected (°C): 3.8 Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: true Date and Initials of Person Examining Contents: CSG.5/11/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions (VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin). Per method, VOA pH is checked after analysis	Sample # <u>1 1/2</u> <u>1/2</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>1 trip blank present</u>
Pace Trip Blank Lot # (if purchased): <u>108215</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>18:13</u> Temp: <u>3.8</u> Corrected Temp: <u>3.8</u>	
Time: <u>18:24</u> put in cooler	
Time: _____ Temp: _____ Corrected Temp: _____	

**Project Manager Review:**

JENNI GROSS

Date: 05/12/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

# WO#: 2054568



Workorder: 10388373

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 5/11/2017

Results Requested By: 5/25/2017

Report To		Subcontract To					Requested Analysis																																		
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 sulfide																																		
																							Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Preserved Containers											LAB USE ONLY
																							1	MW19D-CW-051017	PS	5/10/2017 12:03	10388373001	Water	1												X
																							2																		
																							3																		
4																																									
5																																									
Transfers		Released By		Date/Time	Received By		Date/Time		Comments																																
1		Amanda [Signature]		Pace MN	5/12/17 10:50	[Signature]		Pace	5/13/17 10:00																																
2		Fed Ex		5/13/17 10:00	[Signature]		Pace	5/13/17 10:00																																	
3																																									
Cooler Temperature on Receipt				4.7 °C	Custody Seal			Y	or	N	Received on Ice			Y	or	N	Samples Intact			Y	or	N																			

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon

# WO#: 2054568

PM: ADC

Due Date: 05/25/17

Prc

CLIENT: PASI-MINN



Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 05-13-17 AB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No	
	If added record lot no.: HNO3 _____ H2SO4 _____	
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Chain of Custody

**WO# : 1287514**

PM: CLJ Due Date: 05/25/17  
 CLIENT: PACE MPLS

Page 43 of 44

**Workorder:** 10388373    **Workorder Name:** 1497 UPRR\_Freeman    **Owner Received Date:** 5/11/2017    **Results Requested By:** 5/25/2017

Report To	Subcontract To	Requested Analysis									
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042	5632354 / 5310 TOC									

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										LAB USE ONLY						
						H2SO4																
1	MW19D-GW-051017	PS	5/10/2017 12:03	10388373001	Water	3															X	001
2																						
3																						
4																						
5																						

					Comments									
Transfers	Released By	Date/Time	Received By	Date/Time										
1	<i>[Signature]</i> Pace MN	5/12/17 1045	<i>[Signature]</i>	5/15/17 1725										
2	<i>[Signature]</i>	5/15/17 2145	<i>[Signature]</i>	5/16/17 0800										
3														

**Cooler Temperature on Receipt** 1.4 °C   
 **Custody Seal** (Y) or N   
 **Received on Ice** (Y) or N   
 **Samples Intact** (Y) or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MLV Project #: **WO#: 1287514**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

PM: CLJ Due Date: 05/25/17  
 CLIENT: PACE MPLS

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: HAZ Pkg Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.1 Cooler Temp Corrected °C: 1.4 Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: JDK SIS/17

Comments: MTS-16-17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<u>5-16-17</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>MTS</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Field Data Required?  Yes  No

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 5-16-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



June 15, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

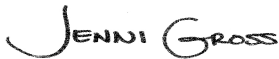
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 02, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390834001	FD01-GW-053117	Water	05/31/17 08:00	06/02/17 09:45
10390834002	Trip Blank-053117	Water	05/31/17 07:00	06/02/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390834001	FD01-GW-053117	RSK 175	DR1	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		EPA 8260B	DJB	83	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10390834002	Trip Blank-053117	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390834001</b>	<b>FD01-GW-053117</b>					
RSK 175	Methane	1.6J	ug/L	10.0	06/05/17 12:10	
6010C Met	Barium, Dissolved	24.0	ug/L	10.0	06/09/17 09:38	
6010C Met	Calcium, Dissolved	44700	ug/L	500	06/09/17 09:38	
6010C Met	Copper, Dissolved	9.2J	ug/L	10.0	06/09/17 09:38	
6010C Met	Iron, Dissolved	150	ug/L	50.0	06/09/17 09:38	
6010C Met	Lead, Dissolved	2.6J	ug/L	10.0	06/09/17 09:38	
6010C Met	Magnesium, Dissolved	14100	ug/L	500	06/09/17 09:38	
6010C Met	Manganese, Dissolved	9.0	ug/L	5.0	06/09/17 09:38	
6010C Met	Potassium, Dissolved	1370J	ug/L	2500	06/09/17 09:38	
6010C Met	Sodium, Dissolved	13900	ug/L	1000	06/09/17 09:38	
6010C Met	Vanadium, Dissolved	5.0J	ug/L	15.0	06/09/17 09:38	
6010C Met	Zinc, Dissolved	233	ug/L	20.0	06/09/17 09:38	
EPA 8260B	Carbon disulfide	2.4	ug/L	1.0	06/03/17 00:12	
EPA 8260B	Carbon tetrachloride	272	ug/L	2.5	06/05/17 15:17	
EPA 8260B	Chloroform	13.4	ug/L	1.0	06/03/17 00:12	
EPA 8260B	Toluene	1.6	ug/L	0.50	06/03/17 00:12	
SM 2320B	Alkalinity, Total as CaCO3	177	mg/L	5.0	06/10/17 10:53	
SM 2540C	Total Dissolved Solids	261	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	5.7	mg/L	1.2	06/02/17 14:31	
EPA 300.0	Nitrate as N	2.4	mg/L	0.10	06/02/17 14:31	H3
EPA 300.0	Sulfate	8.5	mg/L	1.2	06/02/17 14:31	
EPA 353.2	Nitrogen, NO2 plus NO3	2.6	mg/L	0.10	06/08/17 14:07	
SM 5310C	Total Organic Carbon	0.32J	mg/L	1.0	06/07/17 15:18	
<b>10390834002</b>	<b>Trip Blank-053117</b>					
EPA 8260B	Chloroform	0.31J	ug/L	1.0	06/07/17 19:47	
EPA 8260B	Methylene Chloride	0.36J	ug/L	4.0	06/07/17 19:47	
EPA 8260B	Toluene	0.061J	ug/L	1.0	06/07/17 19:47	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 477656

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2602751)
- 2-Hexanone

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 478331

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10391016012

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2605858)
  - Tetrahydrofuran
- MSD (Lab ID: 2605859)
  - Tetrahydrofuran

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479008

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390828002,10390917001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2609779)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2609780)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

### General Information:

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.

- FD01-GW-053117 (Lab ID: 10390834001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 477613

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10389615001,10390831004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2602570)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2602571)
  - Nitrate as N

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

---

**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 478631

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390555001,10391583001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2607473)
  - Nitrogen, NO2 plus NO3
- MS (Lab ID: 2607475)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2607474)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2607476)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

**Sample: FD01-GW-053117**      **Lab ID: 10390834001**      Collected: 05/31/17 08:00      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/05/17 12:10	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/05/17 12:10	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		06/05/17 12:10	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 09:38	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:38	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:38	7440-38-2	
Barium, Dissolved	24.0	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 09:38	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 09:38	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 09:38	7440-43-9	
Calcium, Dissolved	44700	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 09:38	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 09:38	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 09:38	7440-48-4	
Copper, Dissolved	9.2J	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 09:38	7440-50-8	
Iron, Dissolved	150	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 09:38	7439-89-6	
Lead, Dissolved	2.6J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 09:38	7439-92-1	
Magnesium, Dissolved	14100	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 09:38	7439-95-4	
Manganese, Dissolved	9.0	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 09:38	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 09:38	7440-02-0	
Potassium, Dissolved	1370J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 09:38	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 09:38	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 09:38	7440-22-4	
Sodium, Dissolved	13900	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 09:38	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 09:38	7440-28-0	
Vanadium, Dissolved	5.0J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 09:38	7440-62-2	
Zinc, Dissolved	233	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 09:38	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:34	7439-97-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/03/17 00:12	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/03/17 00:12	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/03/17 00:12	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/03/17 00:12	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/03/17 00:12	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/03/17 00:12	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/03/17 00:12	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/03/17 00:12	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/03/17 00:12	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/03/17 00:12	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/03/17 00:12	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/03/17 00:12	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/03/17 00:12	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/03/17 00:12	106-93-4	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Sample: **FD01-GW-053117** Lab ID: **10390834001** Collected: 05/31/17 08:00 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/03/17 00:12	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/03/17 00:12	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/03/17 00:12	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/03/17 00:12	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/03/17 00:12	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/03/17 00:12	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/03/17 00:12	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/03/17 00:12	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/03/17 00:12	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/03/17 00:12	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/03/17 00:12	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/03/17 00:12	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/03/17 00:12	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/03/17 00:12	591-78-6	L3
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/03/17 00:12	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/03/17 00:12	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/03/17 00:12	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/03/17 00:12	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/03/17 00:12	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/03/17 00:12	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/03/17 00:12	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/03/17 00:12	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/03/17 00:12	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/03/17 00:12	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/03/17 00:12	74-83-9	
Carbon disulfide	2.4	ug/L	1.0	0.20	1		06/03/17 00:12	75-15-0	
Carbon tetrachloride	272	ug/L	2.5	0.40	5		06/05/17 15:17	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/03/17 00:12	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/03/17 00:12	75-00-3	
Chloroform	13.4	ug/L	1.0	0.21	1		06/03/17 00:12	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/03/17 00:12	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/03/17 00:12	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/03/17 00:12	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/03/17 00:12	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/03/17 00:12	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/03/17 00:12	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/03/17 00:12	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/03/17 00:12	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/03/17 00:12	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/03/17 00:12	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/03/17 00:12	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/03/17 00:12	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/03/17 00:12	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/03/17 00:12	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/03/17 00:12	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/03/17 00:12	109-99-9	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

**Sample: FD01-GW-053117**      **Lab ID: 10390834001**      Collected: 05/31/17 08:00      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	1.6	ug/L	0.50	0.059	1		06/03/17 00:12	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/03/17 00:12	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/03/17 00:12	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/03/17 00:12	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/03/17 00:12	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/03/17 00:12	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/03/17 00:12	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/03/17 00:12	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/03/17 00:12	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/03/17 00:12	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/03/17 00:12	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/03/17 00:12	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/03/17 00:12	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/03/17 00:12	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/03/17 00:12	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/03/17 00:12	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/03/17 00:12	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/03/17 00:12	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/03/17 00:12	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/03/17 00:12	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		06/03/17 00:12	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		06/03/17 00:12	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		06/03/17 00:12	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	177	mg/L	5.0	1.4	1		06/10/17 10:53		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	261	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:33	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	5.7	mg/L	1.2	0.10	1		06/02/17 14:31	16887-00-6	
Nitrate as N	2.4	mg/L	0.10	0.013	1		06/02/17 14:31	14797-55-8	H3
Sulfate	8.5	mg/L	1.2	0.16	1		06/02/17 14:31	14808-79-8	
<b>353.2 Nitrate + Nitrite</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	2.6	mg/L	0.10	0.037	5		06/08/17 14:07		
<b>410.4 COD</b>		Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	06/14/17 16:18	06/15/17 08:24		

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

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**Sample: FD01-GW-053117**      **Lab ID: 10390834001**      Collected: 05/31/17 08:00      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.32J</b>	mg/L	1.0	0.20	1		06/07/17 15:18	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Sample: Trip Blank-053117 Lab ID: 10390834002 Collected: 05/31/17 07:00 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/07/17 19:47	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 19:47	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/07/17 19:47	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 19:47	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/07/17 19:47	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/07/17 19:47	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/07/17 19:47	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/07/17 19:47	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/07/17 19:47	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/07/17 19:47	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/07/17 19:47	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/07/17 19:47	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/07/17 19:47	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/07/17 19:47	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/07/17 19:47	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/07/17 19:47	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/07/17 19:47	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/07/17 19:47	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/07/17 19:47	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/07/17 19:47	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/07/17 19:47	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/07/17 19:47	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/07/17 19:47	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/07/17 19:47	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/07/17 19:47	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/07/17 19:47	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/07/17 19:47	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/07/17 19:47	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/07/17 19:47	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/07/17 19:47	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/07/17 19:47	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/07/17 19:47	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/07/17 19:47	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/07/17 19:47	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/07/17 19:47	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/07/17 19:47	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/07/17 19:47	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/07/17 19:47	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/07/17 19:47	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/07/17 19:47	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/07/17 19:47	75-00-3	
Chloroform	0.31J	ug/L	1.0	0.21	1		06/07/17 19:47	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/07/17 19:47	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/07/17 19:47	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

**Sample: Trip Blank-053117**      **Lab ID: 10390834002**      Collected: 05/31/17 07:00      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/07/17 19:47	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/07/17 19:47	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/07/17 19:47	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/07/17 19:47	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/07/17 19:47	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/07/17 19:47	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/07/17 19:47	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/07/17 19:47	1634-04-4	
Methylene Chloride	0.36J	ug/L	4.0	0.097	1		06/07/17 19:47	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/07/17 19:47	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/07/17 19:47	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/07/17 19:47	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/07/17 19:47	109-99-9	
Toluene	0.061J	ug/L	1.0	0.059	1		06/07/17 19:47	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/07/17 19:47	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/07/17 19:47	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/07/17 19:47	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/07/17 19:47	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/07/17 19:47	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/07/17 19:47	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/07/17 19:47	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/07/17 19:47	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/07/17 19:47	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/07/17 19:47	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/07/17 19:47	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/07/17 19:47	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/07/17 19:47	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/07/17 19:47	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/07/17 19:47	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/07/17 19:47	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/07/17 19:47	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/07/17 19:47	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		06/07/17 19:47	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/07/17 19:47	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/07/17 19:47	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 477813 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10390834001

METHOD BLANK: 2603683 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/05/17 10:52	
Ethene	ug/L	<0.68	10.0	0.68	06/05/17 10:52	
Methane	ug/L	1.5J	10.0	1.1	06/05/17 10:52	

LABORATORY CONTROL SAMPLE & LCSD: 2603684

Parameter	Units	2603685								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	97.7	103	86	90	85-115	5	20	
Ethene	ug/L	106	91.9	96.5	87	91	85-115	5	20	
Methane	ug/L	60.7	51.7	54.5	85	90	85-115	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2604162

Parameter	Units	2604163										
		10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	89.2	85.4	78	75	30-150	4	20	
Ethene	ug/L	<0.68	106	106	84.8	81.0	80	76	30-150	5	20	
Methane	ug/L	1.5J	60.7	60.7	47.7	45.4	76	72	30-150	5	20	

SAMPLE DUPLICATE: 2604161

Parameter	Units	10390831004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.6J	1.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 478518      Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A      Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10390834001

METHOD BLANK: 2606985      Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/12/17 14:29	

LABORATORY CONTROL SAMPLE: 2606986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606987      2606988

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.7	4.6	95	93	80-120	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 478400 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10390834001

METHOD BLANK: 2606177 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/09/17 09:24	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/09/17 09:24	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/09/17 09:24	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/09/17 09:24	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/09/17 09:24	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/09/17 09:24	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/09/17 09:24	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/09/17 09:24	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/09/17 09:24	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/09/17 09:24	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/09/17 09:24	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/09/17 09:24	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/09/17 09:24	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/09/17 09:24	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/09/17 09:24	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/09/17 09:24	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/09/17 09:24	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/09/17 09:24	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/09/17 09:24	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/09/17 09:24	

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21000	105	80-120	
Antimony, Dissolved	ug/L	1000	1060	106	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1030	103	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19900	99	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1000	100	80-120	
Iron, Dissolved	ug/L	20000	20200	101	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	500	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606181 2606182

Parameter	Units	10390958001		2606181		2606182		% Rec	% Rec	% Rec Limits	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					
Aluminum, Dissolved	ug/L	<13.5	20000	20000	21200	21700	106	109	75-125	2	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1060	1070	106	107	75-125	1	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1040	1060	104	106	75-125	2	20	
Barium, Dissolved	ug/L	36.8	1000	1000	1070	1080	103	105	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1050	1070	105	107	75-125	2	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	1030	1050	103	105	75-125	2	20	
Calcium, Dissolved	ug/L	34800	20000	20000	54400	55000	98	101	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	1010	1040	101	103	75-125	2	20	
Cobalt, Dissolved	ug/L	<0.51	1000	1000	1000	1020	100	102	75-125	2	20	
Copper, Dissolved	ug/L	227	1000	1000	1240	1260	101	103	75-125	2	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	20200	20700	101	104	75-125	2	20	
Lead, Dissolved	ug/L	2.7J	1000	1000	1030	1050	103	105	75-125	2	20	
Magnesium, Dissolved	ug/L	12200	20000	20000	32600	33000	102	104	75-125	1	20	
Manganese, Dissolved	ug/L	0.50J	1000	1000	1030	1050	103	105	75-125	2	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	1010	1030	101	103	75-125	2	20	
Potassium, Dissolved	ug/L	1730J	20000	20000	22500	22700	104	105	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1080	1090	107	109	75-125	2	20	
Silver, Dissolved	ug/L	<0.28	500	500	508	515	102	103	75-125	1	20	
Sodium, Dissolved	ug/L	18100	20000	20000	38100	38200	100	100	75-125	0	20	
Thallium, Dissolved	ug/L	5.0J	1000	1000	1010	1040	100	103	75-125	3	20	
Vanadium, Dissolved	ug/L	6.3J	1000	1000	1010	1020	100	102	75-125	2	20	
Zinc, Dissolved	ug/L	189	1000	1000	1180	1210	100	102	75-125	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 477656 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10390834001

METHOD BLANK: 2602750 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/02/17 17:38	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/02/17 17:38	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/02/17 17:38	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/02/17 17:38	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/02/17 17:38	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/02/17 17:38	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/02/17 17:38	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/02/17 17:38	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/02/17 17:38	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/02/17 17:38	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/02/17 17:38	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/02/17 17:38	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/02/17 17:38	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/02/17 17:38	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/02/17 17:38	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/02/17 17:38	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/02/17 17:38	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/02/17 17:38	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/02/17 17:38	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/02/17 17:38	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/02/17 17:38	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/02/17 17:38	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/02/17 17:38	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/02/17 17:38	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/02/17 17:38	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/02/17 17:38	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/02/17 17:38	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/02/17 17:38	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/02/17 17:38	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/02/17 17:38	
Acetone	ug/L	<0.64	20.0	0.64	06/02/17 17:38	
Acrolein	ug/L	<2.1	10.0	2.1	06/02/17 17:38	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/02/17 17:38	
Benzene	ug/L	<0.042	0.50	0.042	06/02/17 17:38	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/02/17 17:38	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/02/17 17:38	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/02/17 17:38	
Bromoform	ug/L	<0.11	4.0	0.11	06/02/17 17:38	
Bromomethane	ug/L	<0.20	4.0	0.20	06/02/17 17:38	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/02/17 17:38	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/02/17 17:38	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

METHOD BLANK: 2602750

Matrix: Water

Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/02/17 17:38	
Chloroethane	ug/L	<0.12	1.0	0.12	06/02/17 17:38	
Chloroform	ug/L	<0.21	1.0	0.21	06/02/17 17:38	
Chloromethane	ug/L	<0.080	4.0	0.080	06/02/17 17:38	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/02/17 17:38	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/02/17 17:38	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/02/17 17:38	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/02/17 17:38	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/02/17 17:38	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/02/17 17:38	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/02/17 17:38	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/02/17 17:38	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/02/17 17:38	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/02/17 17:38	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/02/17 17:38	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/02/17 17:38	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/02/17 17:38	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/02/17 17:38	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/02/17 17:38	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/02/17 17:38	
Naphthalene	ug/L	<0.064	1.0	0.064	06/02/17 17:38	
o-Xylene	ug/L	<0.044	0.50	0.044	06/02/17 17:38	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/02/17 17:38	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/02/17 17:38	
Styrene	ug/L	<0.056	0.50	0.056	06/02/17 17:38	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/02/17 17:38	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/02/17 17:38	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/02/17 17:38	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/02/17 17:38	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/02/17 17:38	
Toluene	ug/L	<0.059	0.50	0.059	06/02/17 17:38	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/02/17 17:38	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/02/17 17:38	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/02/17 17:38	
Trichloroethene	ug/L	0.11J	0.40	0.044	06/02/17 17:38	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/02/17 17:38	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/02/17 17:38	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/02/17 17:38	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/02/17 17:38	
1,2-Dichloroethane-d4 (S)	%	100	75-137		06/02/17 17:38	
4-Bromofluorobenzene (S)	%	103	75-125		06/02/17 17:38	
Toluene-d8 (S)	%	101	75-125		06/02/17 17:38	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

LABORATORY CONTROL SAMPLE: 2602751

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	18.9	94	75-136	
1,1,1-Trichloroethane	ug/L	20	18.7	94	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	22.2	111	71-138	
1,1,2-Trichloroethane	ug/L	20	21.0	105	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.7	89	69-126	
1,1-Dichloroethane	ug/L	20	20.0	100	75-125	
1,1-Dichloroethene	ug/L	20	18.3	92	75-125	
1,1-Dichloropropene	ug/L	20	20.3	101	75-125	
1,2,3-Trichlorobenzene	ug/L	20	19.7	99	75-125	
1,2,3-Trichloropropane	ug/L	20	22.4	112	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,4-Trimethylbenzene	ug/L	20	20.6	103	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	51.0	102	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.2	101	75-125	
1,2-Dichlorobenzene	ug/L	20	20.5	103	75-125	
1,2-Dichloroethane	ug/L	20	19.0	95	70-125	
1,2-Dichloroethene (Total)	ug/L	40	38.1	95	75-125	
1,2-Dichloropropane	ug/L	20	22.1	111	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.3	101	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	22.0	110	75-125	
1,4-Dichlorobenzene	ug/L	20	19.8	99	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	364	91	64-140	
2,2,4-Trimethylpentane	ug/L	20	17.2	86	68-125	
2,2-Dichloropropane	ug/L	20	19.8	99	70-131	
2-Butanone (MEK)	ug/L	100	125	125	69-125	
2-Chlorotoluene	ug/L	20	19.5	98	75-125	
2-Hexanone	ug/L	100	136	136	73-129 L3	
4-Chlorotoluene	ug/L	20	20.3	102	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	124	124	73-125	
Acetone	ug/L	100	124	124	66-126	
Acrolein	ug/L	200	231	115	56-150	
Acrylonitrile	ug/L	200	216	108	68-129	
Benzene	ug/L	20	18.9	95	75-125	
Bromobenzene	ug/L	20	20.2	101	75-125	
Bromochloromethane	ug/L	20	20.1	100	75-126	
Bromodichloromethane	ug/L	20	18.5	92	75-133	
Bromoform	ug/L	20	17.5	87	62-142	
Bromomethane	ug/L	20	13.1	65	34-143	
Carbon disulfide	ug/L	20	17.7	88	71-125	
Carbon tetrachloride	ug/L	20	16.9	84	71-145	
Chlorobenzene	ug/L	20	19.6	98	75-125	
Chloroethane	ug/L	20	18.6	93	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	23.3	117	54-125	
cis-1,2-Dichloroethene	ug/L	20	19.4	97	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.5	98	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

LABORATORY CONTROL SAMPLE: 2602751

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	17.6	88	74-141	
Dibromomethane	ug/L	20	21.2	106	75-125	
Dichlorodifluoromethane	ug/L	20	20.0	100	59-130	
Dichlorofluoromethane	ug/L	20	18.3	92	75-125	
Diisopropyl ether	ug/L	20	19.9	99	69-125	
Ethyl-tert-butyl ether	ug/L	20	21.1	106	73-125	
Ethylbenzene	ug/L	20	20.3	101	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.6	108	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.3	101	75-125	
m&p-Xylene	ug/L	40	42.9	107	75-125	
Methyl-tert-butyl ether	ug/L	20	21.6	108	75-125	
Methylene Chloride	ug/L	20	20.0	100	73-125	
n-Butylbenzene	ug/L	20	20.5	103	75-125	
n-Propylbenzene	ug/L	20	20.1	101	75-125	
Naphthalene	ug/L	20	19.3	97	74-125	
o-Xylene	ug/L	20	20.8	104	75-125	
p-Isopropyltoluene	ug/L	20	21.4	107	75-125	
sec-Butylbenzene	ug/L	20	20.1	101	75-125	
Styrene	ug/L	20	20.7	104	75-125	
tert-Amylmethyl ether	ug/L	20	20.7	104	71-126	
tert-Butyl Alcohol	ug/L	200	207	103	69-131	
tert-Butylbenzene	ug/L	20	19.9	99	75-125	
Tetrachloroethene	ug/L	20	18.3	91	75-125	
Tetrahydrofuran	ug/L	200	173	86	65-127	
Toluene	ug/L	20	19.4	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.7	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	18.0	90	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	39.5	79	30-150	
Trichloroethene	ug/L	20	19.6	98	75-125	
Trichlorofluoromethane	ug/L	20	18.6	93	71-140	
Vinyl acetate	ug/L	20	21.1	106	68-137	
Vinyl chloride	ug/L	20	21.2	106	70-125	
Xylene (Total)	ug/L	60	63.7	106	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			100	75-125	
Toluene-d8 (S)	%			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2602752 2602753

Parameter	Units	2602752		2602753		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10390687003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	17.8	19.3	89	96	75-137	8	30	
1,1,1-Trichloroethane	ug/L	<0.057	20	20	19.4	20.4	97	102	75-139	5	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	20.0	21.4	100	107	60-142	7	30	
1,1,2-Trichloroethane	ug/L	<0.064	20	20	18.6	20.1	93	101	75-128	8	30	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Parameter	Units	2602752		2602753		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10390687003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	20.2	20.9	101	105	62-150	3	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	19.8	21.1	99	105	70-129	6	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	19.3	20.0	96	100	67-141	4	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	20.9	22.3	104	111	64-144	6	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	19.5	20.7	98	104	66-139	6	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.9	21.3	99	107	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	20.5	21.8	102	109	65-138	6	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	19.6	21.0	98	105	65-143	7	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	45.1	51.5	90	103	61-134	13	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	17.9	19.0	90	95	74-129	6	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	18.3	20.0	91	100	68-135	9	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	16.9	17.8	85	89	73-125	5	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	38.3	39.6	96	99	69-134	3	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	20.3	21.4	101	107	64-130	5	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	19.8	21.0	99	105	64-146	6	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	18.9	20.2	95	101	69-135	6	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.7	20.8	98	104	67-128	6	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	18.1	19.3	90	96	66-134	6	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	333	390	83	98	58-140	16	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	23.3	22.8	116	114	48-150	2	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	20.6	21.4	103	107	50-150	4	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	94.5	102	94	102	58-125	8	30		
2-Chlorotoluene	ug/L	<0.084	20	20	18.2	19.6	91	98	65-138	8	30		
2-Hexanone	ug/L	<0.19	100	100	112	127	112	127	61-134	13	30		
4-Chlorotoluene	ug/L	<0.048	20	20	18.6	20.2	93	101	68-135	8	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	111	122	111	122	61-130	10	30		
Acetone	ug/L	4.0J	100	100	138	139	134	135	51-140	0	30		
Acrolein	ug/L	<2.1	200	200	244	263	122	131	48-150	8	30		
Acrylonitrile	ug/L	<0.49	200	200	191	209	96	104	55-134	9	30		
Benzene	ug/L	<0.042	20	20	18.5	19.7	92	99	63-132	7	30		
Bromobenzene	ug/L	<0.087	20	20	18.5	20.0	93	100	67-138	8	30		
Bromochloromethane	ug/L	<0.082	20	20	18.4	19.7	92	99	66-138	7	30		
Bromodichloromethane	ug/L	<0.068	20	20	17.0	17.9	85	89	75-137	5	30		
Bromoform	ug/L	<0.11	20	20	16.2	17.2	81	86	65-129	6	30		
Bromomethane	ug/L	<0.20	20	20	14.4	16.1	72	80	41-150	11	30		
Carbon disulfide	ug/L	<0.20	20	20	19.1	19.5	95	97	72-132	2	30		
Carbon tetrachloride	ug/L	<0.079	20	20	17.9	18.7	89	93	75-150	4	30		
Chlorobenzene	ug/L	<0.066	20	20	18.1	19.4	90	97	73-127	7	30		
Chloroethane	ug/L	<0.12	20	20	18.4	19.9	92	99	74-138	8	30		
Chloroform	ug/L	<0.21	20	20	17.8	18.9	89	95	74-125	6	30		
Chloromethane	ug/L	<0.080	20	20	22.3	24.3	112	121	58-129	8	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	18.9	19.9	95	100	63-135	5	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	17.7	18.3	89	91	66-129	3	30		
Dibromochloromethane	ug/L	<0.048	20	20	16.5	17.5	83	87	75-133	6	30		

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Parameter	Units	2602752		2602753		MS % Rec	MSD % Rec	% Rec	Limits	RPD	Max RPD	Qual
		10390687003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.14	20	20	18.9	20.0	94	100	68-134	6	30	
Dichlorodifluoromethane	ug/L	<0.075	20	20	22.9	24.1	115	120	72-150	5	30	
Dichlorofluoromethane	ug/L	<0.054	20	20	18.3	19.3	91	97	75-129	6	30	
Diisopropyl ether	ug/L	<0.050	20	20	18.4	19.6	92	98	62-128	6	30	
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	19.6	20.8	98	104	63-132	6	30	
Ethylbenzene	ug/L	<0.075	20	20	19.1	20.6	95	103	72-130	8	30	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	25.5	26.0	127	130	71-150	2	30	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	19.5	21.0	97	105	70-136	7	30	
m&p-Xylene	ug/L	<0.11	40	40	40.2	43.1	101	108	64-142	7	30	
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.8	20.9	99	104	72-125	5	30	
Methylene Chloride	ug/L	<0.097	20	20	17.7	18.4	89	92	60-132	4	30	
n-Butylbenzene	ug/L	<0.16	20	20	22.2	22.6	111	113	60-150	2	30	
n-Propylbenzene	ug/L	<0.049	20	20	19.9	21.3	99	106	63-142	7	30	
Naphthalene	ug/L	<0.064	20	20	17.8	19.6	89	98	67-125	10	30	
o-Xylene	ug/L	<0.044	20	20	19.3	20.8	97	104	60-143	7	30	
p-Isopropyltoluene	ug/L	<0.064	20	20	22.2	23.2	111	116	64-146	4	30	
sec-Butylbenzene	ug/L	<0.094	20	20	21.0	22.1	105	111	67-144	5	30	
Styrene	ug/L	<0.056	20	20	18.7	20.0	93	100	67-136	7	30	
tert-Amylmethyl ether	ug/L	<0.073	20	20	18.9	20.0	95	100	60-134	5	30	
tert-Butyl Alcohol	ug/L	<0.89	200	200	200	229	100	115	56-146	14	30	
tert-Butylbenzene	ug/L	<0.051	20	20	20.4	21.6	102	108	68-135	6	30	
Tetrachloroethene	ug/L	<0.13	20	20	18.0	19.5	90	97	67-148	8	30	
Tetrahydrofuran	ug/L	<1.5	200	200	258	267	129	133	51-141	3	30	
Toluene	ug/L	<0.059	20	20	18.4	19.8	92	99	61-140	7	30	
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	19.4	19.7	97	99	62-138	2	30	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	16.5	17.7	83	89	67-134	7	30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	36.3	40.9	73	82	30-150	12	30	
Trichloroethene	ug/L	<0.044	20	20	19.7	20.6	98	103	64-149	4	30	
Trichlorofluoromethane	ug/L	<0.055	20	20	20.2	21.4	101	107	75-150	6	30	
Vinyl acetate	ug/L	<0.12	20	20	19.7	20.6	99	103	49-143	4	30	
Vinyl chloride	ug/L	<0.098	20	20	22.0	23.1	110	115	75-133	5	30	
Xylene (Total)	ug/L	<0.15	60	60	59.6	64.0	99	107	63-142	7	30	
1,2-Dichloroethane-d4 (S)	%						97	96	75-137			
4-Bromofluorobenzene (S)	%						101	104	75-125			
Toluene-d8 (S)	%						101	101	75-125			

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

QC Batch: 478331	Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B	Analysis Description: 8260 MSV LL Water
Associated Lab Samples: 10390834002	

METHOD BLANK: 2605856 Matrix: Water

Associated Lab Samples: 10390834002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/07/17 17:14	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/07/17 17:14	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/07/17 17:14	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/07/17 17:14	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/07/17 17:14	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/07/17 17:14	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/07/17 17:14	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/07/17 17:14	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/07/17 17:14	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/07/17 17:14	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/07/17 17:14	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/07/17 17:14	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/07/17 17:14	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/07/17 17:14	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/07/17 17:14	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/07/17 17:14	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/07/17 17:14	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/07/17 17:14	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/07/17 17:14	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/07/17 17:14	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/07/17 17:14	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/07/17 17:14	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/07/17 17:14	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/07/17 17:14	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/07/17 17:14	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/07/17 17:14	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/07/17 17:14	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/07/17 17:14	
Acetone	ug/L	<0.64	20.0	0.64	06/07/17 17:14	
Acrolein	ug/L	<2.1	10.0	2.1	06/07/17 17:14	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/07/17 17:14	
Benzene	ug/L	<0.042	0.50	0.042	06/07/17 17:14	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/07/17 17:14	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/07/17 17:14	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/07/17 17:14	
Bromoform	ug/L	<0.11	4.0	0.11	06/07/17 17:14	
Bromomethane	ug/L	<0.20	4.0	0.20	06/07/17 17:14	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/07/17 17:14	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/07/17 17:14	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

METHOD BLANK: 2605856 Matrix: Water  
Associated Lab Samples: 10390834002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/07/17 17:14	
Chloroethane	ug/L	<0.12	1.0	0.12	06/07/17 17:14	
Chloroform	ug/L	<0.21	1.0	0.21	06/07/17 17:14	
Chloromethane	ug/L	<0.080	4.0	0.080	06/07/17 17:14	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/07/17 17:14	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/07/17 17:14	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/07/17 17:14	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/07/17 17:14	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/07/17 17:14	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/07/17 17:14	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/07/17 17:14	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/07/17 17:14	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/07/17 17:14	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/07/17 17:14	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/07/17 17:14	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/07/17 17:14	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/07/17 17:14	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/07/17 17:14	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/07/17 17:14	
Naphthalene	ug/L	<0.064	1.0	0.064	06/07/17 17:14	
o-Xylene	ug/L	<0.044	0.50	0.044	06/07/17 17:14	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/07/17 17:14	
Styrene	ug/L	<0.056	0.50	0.056	06/07/17 17:14	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/07/17 17:14	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/07/17 17:14	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/07/17 17:14	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/07/17 17:14	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/07/17 17:14	
Toluene	ug/L	<0.059	1.0	0.059	06/07/17 17:14	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/07/17 17:14	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/07/17 17:14	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/07/17 17:14	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/07/17 17:14	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/07/17 17:14	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/07/17 17:14	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/07/17 17:14	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/07/17 17:14	
1,2-Dichloroethane-d4 (S)	%	100	75-137		06/07/17 17:14	
4-Bromofluorobenzene (S)	%	102	75-125		06/07/17 17:14	
Toluene-d8 (S)	%	100	75-125		06/07/17 17:14	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

LABORATORY CONTROL SAMPLE: 2605857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.6	103	75-136	
1,1,1-Trichloroethane	ug/L	20	19.5	97	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.4	102	71-138	
1,1,2-Trichloroethane	ug/L	20	18.9	95	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.0	100	69-126	
1,1-Dichloroethane	ug/L	20	19.0	95	75-125	
1,1-Dichloroethene	ug/L	20	19.1	95	75-125	
1,1-Dichloropropene	ug/L	20	20.2	101	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.3	102	75-125	
1,2,3-Trichloropropane	ug/L	20	21.3	107	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.9	100	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.4	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.0	106	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.1	105	75-125	
1,2-Dichlorobenzene	ug/L	20	21.2	106	75-125	
1,2-Dichloroethane	ug/L	20	19.6	98	70-125	
1,2-Dichloroethene (Total)	ug/L	40	38.5	96	75-125	
1,2-Dichloropropane	ug/L	20	19.8	99	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.6	103	75-125	
1,3-Dichlorobenzene	ug/L	20	20.1	101	75-125	
1,3-Dichloropropane	ug/L	20	21.1	105	75-125	
1,4-Dichlorobenzene	ug/L	20	19.7	99	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	409	102	64-140	
2,2,4-Trimethylpentane	ug/L	20	19.8	99	68-125	
2,2-Dichloropropane	ug/L	20	19.0	95	70-131	
2-Butanone (MEK)	ug/L	100	95.8	96	69-125	
2-Chlorotoluene	ug/L	20	20.6	103	75-125	
2-Hexanone	ug/L	100	109	109	73-129	
4-Chlorotoluene	ug/L	20	20.9	104	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	105	73-125	
Acetone	ug/L	100	96.0	96	66-126	
Acrolein	ug/L	200	214	107	56-150	
Acrylonitrile	ug/L	200	194	97	68-129	
Benzene	ug/L	20	19.4	97	75-125	
Bromobenzene	ug/L	20	20.2	101	75-125	
Bromochloromethane	ug/L	20	19.9	100	75-126	
Bromodichloromethane	ug/L	20	20.1	100	75-133	
Bromoform	ug/L	20	19.6	98	62-142	
Bromomethane	ug/L	20	20.9	105	34-143	
Carbon disulfide	ug/L	20	18.4	92	71-125	
Carbon tetrachloride	ug/L	20	20.8	104	71-145	
Chlorobenzene	ug/L	20	19.9	100	75-125	
Chloroethane	ug/L	20	18.7	93	75-125	
Chloroform	ug/L	20	19.0	95	75-125	
Chloromethane	ug/L	20	18.8	94	54-125	
cis-1,2-Dichloroethene	ug/L	20	19.6	98	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

LABORATORY CONTROL SAMPLE: 2605857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	19.7	99	74-141	
Dibromomethane	ug/L	20	21.0	105	75-125	
Dichlorodifluoromethane	ug/L	20	19.6	98	59-130	
Dichlorofluoromethane	ug/L	20	19.1	95	75-125	
Diisopropyl ether	ug/L	20	19.0	95	69-125	
Ethyl-tert-butyl ether	ug/L	20	20.2	101	73-125	
Ethylbenzene	ug/L	20	19.6	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.1	105	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.9	105	75-125	
m&p-Xylene	ug/L	40	40.9	102	75-125	
Methyl-tert-butyl ether	ug/L	20	19.9	99	75-125	
Methylene Chloride	ug/L	20	18.4	92	73-125	
n-Butylbenzene	ug/L	20	20.8	104	75-125	
n-Propylbenzene	ug/L	20	20.3	101	75-125	
Naphthalene	ug/L	20	20.4	102	74-125	
o-Xylene	ug/L	20	21.3	107	75-125	
p-Isopropyltoluene	ug/L	20	19.4	97	75-125	
sec-Butylbenzene	ug/L	20	20.8	104	75-125	
Styrene	ug/L	20	19.2	96	75-125	
tert-Amylmethyl ether	ug/L	20	20.3	101	71-126	
tert-Butyl Alcohol	ug/L	200	203	101	69-131	
tert-Butylbenzene	ug/L	20	20.6	103	75-125	
Tetrachloroethene	ug/L	20	19.9	99	75-125	
Tetrahydrofuran	ug/L	200	216	108	65-127	
Toluene	ug/L	20	18.2	91	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.4	99	30-150	
Trichloroethene	ug/L	20	19.2	96	75-125	
Trichlorofluoromethane	ug/L	20	19.7	99	71-140	
Vinyl acetate	ug/L	20	18.9	94	68-137	
Vinyl chloride	ug/L	20	19.1	96	70-125	
Xylene (Total)	ug/L	60	62.2	104	75-125	
1,2-Dichloroethane-d4 (S)	%			97	75-137	
4-Bromofluorobenzene (S)	%			102	75-125	
Toluene-d8 (S)	%			99	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2605858 2605859

Parameter	Units	2605858		2605859		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	ND	20	22.2	22.1	111	111	75-137	0	30	
1,1,1-Trichloroethane	ug/L	ND	20	21.3	21.5	107	107	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.9	21.0	105	105	60-142	1	30	
1,1,2-Trichloroethane	ug/L	ND	20	19.4	19.2	97	96	75-128	1	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

Parameter	Units	10391016012		2605858		2605859		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	24.1	23.4	121	117	62-150	3	30		
1,1-Dichloroethane	ug/L	ND	20	20	20.2	20.2	101	101	70-129	0	30		
1,1-Dichloroethene	ug/L	ND	20	20	21.3	20.8	106	104	67-141	2	30		
1,1-Dichloropropene	ug/L	ND	20	20	22.6	22.6	113	113	64-144	0	30		
1,2,3-Trichlorobenzene	ug/L	ND	20	20	20.7	19.6	103	98	66-139	5	30		
1,2,3-Trichloropropane	ug/L	ND	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	ND	20	20	20.6	19.9	103	100	65-138	3	30		
1,2,4-Trimethylbenzene	ug/L	ND	20	20	20.7	20.4	103	102	65-143	1	30		
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	52.7	54.3	105	109	61-134	3	30		
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	22.0	21.9	108	108	74-129	0	30		
1,2-Dichlorobenzene	ug/L	ND	20	20	21.7	21.6	108	108	68-135	0	30		
1,2-Dichloroethane	ug/L	ND	20	20	19.9	20.0	100	100	73-125	0	30		
1,2-Dichloroethene (Total)	ug/L	ND	40	40	41.0	40.6	102	102	69-134	1	30		
1,2-Dichloropropane	ug/L	ND	20	20	20.8	20.9	104	105	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	ND	20	20	22.4	21.9	112	110	64-146	2	30		
1,3-Dichlorobenzene	ug/L	ND	20	20	20.9	21.0	105	105	69-135	0	30		
1,3-Dichloropropane	ug/L	ND	20	20	21.5	21.5	107	108	67-128	0	30		
1,4-Dichlorobenzene	ug/L	ND	20	20	20.6	20.5	103	102	66-134	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	413	392	103	98	58-140	5	30		
2,2,4-Trimethylpentane	ug/L	ND	20	20	24.2	23.1	121	115	48-150	5	30		
2,2-Dichloropropane	ug/L	ND	20	20	21.9	21.2	110	106	50-150	3	30		
2-Butanone (MEK)	ug/L	ND	100	100	96.3	97.3	94	95	58-125	1	30		
2-Chlorotoluene	ug/L	ND	20	20	21.8	22.2	109	111	65-138	2	30		
2-Hexanone	ug/L	ND	100	100	110	111	110	111	61-134	1	30		
4-Chlorotoluene	ug/L	ND	20	20	22.4	22.2	112	111	68-135	1	30		
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	106	108	106	108	61-130	1	30		
Acetone	ug/L	103	100	100	191	202	88	98	51-140	5	30		
Acrolein	ug/L	ND	200	200	250	249	125	125	48-150	0	30		
Acrylonitrile	ug/L	ND	200	200	193	195	97	97	55-134	1	30		
Benzene	ug/L	ND	20	20	20.6	20.6	103	103	63-132	0	30		
Bromobenzene	ug/L	ND	20	20	21.0	21.0	105	105	67-138	0	30		
Bromochloromethane	ug/L	ND	20	20	20.7	20.2	103	101	66-138	2	30		
Bromodichloromethane	ug/L	ND	20	20	21.7	21.7	109	108	75-137	0	30		
Bromoform	ug/L	ND	20	20	20.2	19.9	101	100	65-129	1	30		
Bromomethane	ug/L	ND	20	20	22.5	22.2	113	111	41-150	2	30		
Carbon disulfide	ug/L	ND	20	20	20.3	19.8	102	99	72-132	3	30		
Carbon tetrachloride	ug/L	ND	20	20	23.6	22.8	118	114	75-150	3	30		
Chlorobenzene	ug/L	ND	20	20	21.0	21.0	105	105	73-127	0	30		
Chloroethane	ug/L	ND	20	20	21.1	20.5	105	103	74-138	3	30		
Chloroform	ug/L	ND	20	20	20.1	19.9	100	99	74-125	1	30		
Chloromethane	ug/L	ND	20	20	20.7	20.0	103	100	58-129	3	30		
cis-1,2-Dichloroethene	ug/L	ND	20	20	20.3	20.3	102	101	63-135	0	30		
cis-1,3-Dichloropropene	ug/L	ND	20	20	19.7	20.0	99	100	66-129	1	30		
Dibromochloromethane	ug/L	ND	20	20	20.7	20.6	103	103	75-133	0	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2605858		2605859		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10391016012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	ND	20	20	21.9	22.2	110	111	68-134	1	30		
Dichlorodifluoromethane	ug/L	ND	20	20	23.6	22.6	118	113	72-150	4	30		
Dichlorofluoromethane	ug/L	ND	20	20	20.7	20.5	104	102	75-129	1	30		
Diisopropyl ether	ug/L	ND	20	20	19.8	19.5	99	98	62-128	1	30		
Ethyl-tert-butyl ether	ug/L	ND	20	20	21.0	20.9	105	104	63-132	1	30		
Ethylbenzene	ug/L	ND	20	20	21.2	21.5	106	107	72-130	1	30		
Hexachloro-1,3-butadiene	ug/L	ND	20	20	23.2	22.0	116	110	71-150	5	30		
Isopropylbenzene (Cumene)	ug/L	ND	20	20	23.0	22.7	115	114	70-136	1	30		
m&p-Xylene	ug/L	ND	40	40	45.1	44.4	113	111	64-142	2	30		
Methyl-tert-butyl ether	ug/L	ND	20	20	20.2	20.1	101	101	72-125	1	30		
Methylene Chloride	ug/L	ND	20	20	18.3	18.1	92	90	60-132	1	30		
n-Butylbenzene	ug/L	ND	20	20	22.9	22.1	114	110	60-150	4	30		
n-Propylbenzene	ug/L	ND	20	20	22.2	22.0	111	110	63-142	1	30		
Naphthalene	ug/L	ND	20	20	20.3	20.1	102	101	67-125	1	30		
o-Xylene	ug/L	ND	20	20	23.1	22.9	116	114	60-143	1	30		
p-Isopropyltoluene	ug/L	ND	20	20	21.2	20.8	106	104	64-146	2	30		
sec-Butylbenzene	ug/L	ND	20	20	23.1	22.8	115	114	67-144	1	30		
Styrene	ug/L	ND	20	20	20.0	19.9	100	100	67-136	0	30		
tert-Amylmethyl ether	ug/L	ND	20	20	20.8	20.7	104	104	60-134	0	30		
tert-Butyl Alcohol	ug/L	ND	200	200	212	204	102	98	56-146	4	30		
tert-Butylbenzene	ug/L	ND	20	20	22.7	22.4	114	112	68-135	2	30		
Tetrachloroethene	ug/L	ND	20	20	22.3	21.9	112	109	67-148	2	30		
Tetrahydrofuran	ug/L	ND	200	200	367	358	184	179	51-141	3	30	M1	
Toluene	ug/L	ND	20	20	19.0	19.1	95	96	61-140	1	30		
trans-1,2-Dichloroethene	ug/L	ND	20	20	20.6	20.4	103	102	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	ND	20	20	21.1	20.9	106	104	67-134	1	30		
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	51.8	52.0	104	104	30-150	0	30		
Trichloroethene	ug/L	ND	20	20	21.1	21.1	106	105	64-149	0	30		
Trichlorofluoromethane	ug/L	ND	20	20	23.3	22.6	116	113	75-150	3	30		
Vinyl acetate	ug/L	ND	20	20	18.5	18.8	93	94	49-143	1	30		
Vinyl chloride	ug/L	ND	20	20	21.9	21.6	109	108	75-133	1	30		
Xylene (Total)	ug/L	ND	60	60	68.2	67.2	114	112	63-142	1	30		
1,2-Dichloroethane-d4 (S)	%						98	98	75-137				
4-Bromofluorobenzene (S)	%						102	102	75-125				
Toluene-d8 (S)	%						101	100	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 479008 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10390834001

METHOD BLANK: 2609776 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/10/17 09:30	

LABORATORY CONTROL SAMPLE & LCSD: 2609777 2609778

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	41.4	41.9	104	105	90-110	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609779 2609780

Parameter	Units	10390828002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	441	40	40	500	496	148	138	80-120	1	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609781 2609782

Parameter	Units	10390917001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	315	40	40	359	347	111	82	80-120	3	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 478006 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10390834001

METHOD BLANK: 2604393 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/06/17 15:39	

LABORATORY CONTROL SAMPLE: 2604394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	942	94	80-120	

SAMPLE DUPLICATE: 2604395

Parameter	Units	10390815003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	301	300	0	10	

SAMPLE DUPLICATE: 2604396

Parameter	Units	10390958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	299	305	2	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 82033 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10390834001

METHOD BLANK: 348613 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/07/17 09:32	

LABORATORY CONTROL SAMPLE: 348614

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 348616

Parameter	Units	10390833004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	102	75-125	

SAMPLE DUPLICATE: 348615

Parameter	Units	10390833004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 477613 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10390834001

METHOD BLANK: 2602566 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/02/17 21:27	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/02/17 21:27	
Sulfate	mg/L	<0.16	1.2	0.16	06/02/17 21:27	

LABORATORY CONTROL SAMPLE: 2602567

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.1	97	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	11.3	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2602568 2602569

Parameter	Units	10389615001		2602568		2602569		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	6.5	12.5	12.5	18.1	18.3	93	94	90-110	1	20		
Nitrate as N	mg/L	0.36	1	1	1.3	1.3	91	94	90-110	2	20		
Sulfate	mg/L	8.1	12.5	12.5	19.3	19.5	90	92	90-110	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2602570 2602571

Parameter	Units	10390831004		2602570		2602571		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	5.7	12.5	12.5	16.8	17.7	89	96	90-110	5	20	M1	
Nitrate as N	mg/L	2.4	1	1	3.2	3.3	78	83	90-110	2	20	M1	
Sulfate	mg/L	8.5	12.5	12.5	19.3	20.1	86	92	90-110	4	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 478631 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10390834001

METHOD BLANK: 2607471 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/08/17 13:58	FS

LABORATORY CONTROL SAMPLE: 2607472

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2607473 2607474

Parameter	Units	10391583001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result										
Nitrogen, NO2 plus NO3	mg/L	0.024	1	1	0.89	0.87	87	85	90-110	2	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2607475 2607476

Parameter	Units	10390555001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result										
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.81	0.84	81	84	90-110	3	20	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 479520 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10390834001

METHOD BLANK: 2611887 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/15/17 08:24	

LABORATORY CONTROL SAMPLE: 2611888

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	306	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611889 2611890

Parameter	Units	10390834001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chemical Oxygen Demand	mg/L	<15.8	250	250	274	261	104	99	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611891 2611892

Parameter	Units	10391003001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chemical Oxygen Demand	mg/L	34.9J	250	250	294	291	104	102	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

QC Batch: 115712 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10390834001

METHOD BLANK: 456457 Matrix: Water  
Associated Lab Samples: 10390834001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/07/17 14:51	

LABORATORY CONTROL SAMPLE: 456458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.6	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456459 456460

Parameter	Units	10390833004		456460		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.								
Total Organic Carbon	mg/L	0.46J	25	25	25.5	25.8	100	101	80-120	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456461 456462

Parameter	Units	10390958001		456462		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.								
Total Organic Carbon	mg/L	0.34J	25	25	25.4	25.8	100	102	80-120	2	20		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390834

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis  
PASI-N Pace Analytical Services - New Orleans  
PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

H3 Sample was received or analysis requested beyond the recognized method holding time.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390834

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10390834001	FD01-GW-053117	RSK 175	477813		
10390834001	FD01-GW-053117	EPA 3010	478400	6010C Met	478860
10390834001	FD01-GW-053117	EPA 7470A	478518	EPA 7470A	479036
10390834001	FD01-GW-053117	EPA 8260B	477656		
10390834002	Trip Blank-053117	EPA 8260B	478331		
10390834001	FD01-GW-053117	SM 2320B	479008		
10390834001	FD01-GW-053117	SM 2540C	478006		
10390834001	FD01-GW-053117	SM 4500-S-2 D	82033		
10390834001	FD01-GW-053117	EPA 300.0	477613		
10390834001	FD01-GW-053117	EPA 353.2	478631		
10390834001	FD01-GW-053117	EPA 410.4	479520	EPA 410.4	479699
10390834001	FD01-GW-053117	SM 5310C	115712		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

### Section A

#### Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2m.com  
 Phone: [ ] Fax: [ ]  
 Requested Due Date/Circle: 10 Day Standard

### Section B

#### Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #:  
 Project Name: UPRR Freeman  
 Project #: 1497

### Section C

#### Invoice Information:

Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: CAS  
 Pace Quote:  
 Pace Project Manager:  
 Pace Profile #: 3644714

Page: **1** Of **1**  
**10390834**  
 Regulatory Agency  
 State / Location  
 WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Y/N	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)			
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH	NaOH + Zn Acetate	Na2S2O3		Other	Analyses Test	Low Level VOCs by 8280	601/07/470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175		COD 410.4	Nitrate+Nitrite 353.2	
1	FD01-GW-053117							5/31/17	0500	12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Field Dup 051
2	Trip Blank-053117							1	0700	1				X																		Trip Blank	
3																																	
4																																	
5																																	
6																																	
7																																	
8																																	
9																																	
10																																	
11																																	
12																																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	ZXB/CH2M	5/31/17	1619	[Signature]	6/21/17	945	4.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE  
 PRINT Name of SAMPLER: **L. Boumann**  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed: **5-31-17**

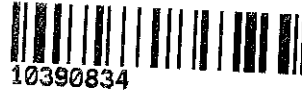
TEMP in C  
 Received on Ice (Y/N)  
 Custody Sealed (Y/N)  
 Cooler (Y/N)  
 Samples Intact (Y/N)

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: **CH2M Hill**

Project #:

**WO#: 10390834**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other:  
 Tracking Number: **7222 2740 1540**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **4.4** Cooler Temp Corrected (°C): **4.5** Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C Correction Factor: **10.1** Date and Initials of Person Examining Contents: **6-2-17 MS**

USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Nitrate out of hold
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. NO MS/MSD
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: <b>VOA</b> Coliform, <b>DOC</b> DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <b>1 1 1</b>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. shared TB w/ 10390831
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>120353</b>		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1220</b>	Temp: <b>4.4</b>	Corrected Temp: <b>4.5</b>
Time: <b>1240</b>	put in cooler	
Time:	Temp:	Corrected Temp:

Project Manager Review:

**JENNI GROSS**

Date: **06/02/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Rece

# WO#: 2055625

PM: ADC Due Date: 06/16/17

CLIENT: PASI-MINN

## Project

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-06-17 [initials]

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_


\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**Sample Condition Upon Receipt**

Client Name: Pace MIV Project #: \_\_\_\_\_

**WO# 1288648**



1288648

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Hot Pack Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.1 Cooler Temp Corrected °C: 1.4 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: JPK 6/15/17

Comments: MA 6-17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>COC says 3 vials, only 2 vials</u>
-Includes Date/Time/ID/Analysis Matrix: <u>LOT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N  
 Project Manager Review: [Signature] Date: 6-6-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 17, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

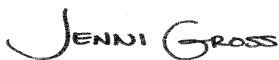
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on July 17, 2017 to update the sample ID for 10390956001 to MW8S-GW-060217, per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: UST-078  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: MN00064  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8 Certification #: 8TMS-L  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Michigan Certification #: 9909

Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia WW Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

---

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
California Certification #2973  
Montana Certificate #CERT0103  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842015-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC):  
E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC):  
T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390956001	MW8S-GW-060217	Water	06/02/17 10:15	06/03/17 09:15
10390956002	MW6S-GW-060217	Water	06/02/17 11:05	06/03/17 09:15
10390956003	MW1S-GW-060217	Water	06/02/17 11:45	06/03/17 09:15
10390956004	MW9S-GW-060217	Water	06/02/17 12:25	06/03/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390956001	MW8S-GW-060217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10390956002	MW6S-GW-060217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10390956003	MW1S-GW-060217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10390956004	MW9S-GW-060217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10390956001</b>	<b>MW8S-GW-060217</b>					
RSK 175	Methane	2.0J	ug/L	10.0	06/07/17 12:48	
6010C Met	Aluminum, Dissolved	96.2J	ug/L	200	06/09/17 10:02	
6010C Met	Barium, Dissolved	43.6	ug/L	10.0	06/09/17 10:02	
6010C Met	Calcium, Dissolved	46000	ug/L	500	06/09/17 10:02	
6010C Met	Copper, Dissolved	2.1J	ug/L	10.0	06/09/17 10:02	
6010C Met	Iron, Dissolved	204	ug/L	50.0	06/09/17 10:02	
6010C Met	Lead, Dissolved	3.0J	ug/L	10.0	06/09/17 10:02	
6010C Met	Magnesium, Dissolved	10900	ug/L	500	06/09/17 10:02	
6010C Met	Manganese, Dissolved	76.8	ug/L	5.0	06/09/17 10:02	
6010C Met	Nickel, Dissolved	2.1J	ug/L	20.0	06/09/17 10:02	
6010C Met	Potassium, Dissolved	473J	ug/L	2500	06/09/17 10:02	
6010C Met	Sodium, Dissolved	13700	ug/L	1000	06/09/17 10:02	
6010C Met	Thallium, Dissolved	4.1J	ug/L	20.0	06/09/17 10:02	
6010C Met	Vanadium, Dissolved	2.0J	ug/L	15.0	06/09/17 10:02	
6010C Met	Zinc, Dissolved	31.9	ug/L	20.0	06/09/17 10:02	
SM 2320B	Alkalinity, Total as CaCO3	131	mg/L	5.0	06/10/17 14:24	
SM 2540C	Total Dissolved Solids	289	mg/L	10.0	06/07/17 13:20	
SM 4500-S-2 D	Sulfide, Total	0.0063J	mg/L	0.020	06/07/17 09:34	
EPA 300.0	Chloride	3.9	mg/L	1.2	06/03/17 14:46	
EPA 300.0	Nitrate as N	7.7	mg/L	0.10	06/03/17 14:46	
EPA 300.0	Sulfate	19.6	mg/L	1.2	06/03/17 14:46	
EPA 353.2	Nitrogen, NO2 plus NO3	7.8	mg/L	0.20	06/09/17 15:09	
SM 5310C	Total Organic Carbon	1.6	mg/L	1.0	06/07/17 23:13	
<b>10390956002</b>	<b>MW6S-GW-060217</b>					
RSK 175	Methane	2.0J	ug/L	10.0	06/07/17 12:55	
6010C Met	Barium, Dissolved	43.1	ug/L	10.0	06/09/17 10:05	
6010C Met	Cadmium, Dissolved	0.81J	ug/L	3.0	06/09/17 10:05	
6010C Met	Calcium, Dissolved	36000	ug/L	500	06/09/17 10:05	
6010C Met	Iron, Dissolved	18.5J	ug/L	50.0	06/09/17 10:05	
6010C Met	Lead, Dissolved	2.4J	ug/L	10.0	06/09/17 10:05	
6010C Met	Magnesium, Dissolved	10000	ug/L	500	06/09/17 10:05	
6010C Met	Manganese, Dissolved	3.4J	ug/L	5.0	06/09/17 10:05	
6010C Met	Potassium, Dissolved	627J	ug/L	2500	06/09/17 10:05	
6010C Met	Sodium, Dissolved	12100	ug/L	1000	06/09/17 10:05	
6010C Met	Thallium, Dissolved	4.2J	ug/L	20.0	06/09/17 10:05	
6010C Met	Vanadium, Dissolved	5.0J	ug/L	15.0	06/09/17 10:05	
6010C Met	Zinc, Dissolved	8.9J	ug/L	20.0	06/09/17 10:05	
SM 2320B	Alkalinity, Total as CaCO3	148	mg/L	5.0	06/10/17 14:28	
SM 2540C	Total Dissolved Solids	208	mg/L	10.0	06/07/17 13:20	
EPA 300.0	Chloride	2.4	mg/L	1.2	06/03/17 15:01	B
EPA 300.0	Nitrate as N	0.098J	mg/L	0.10	06/03/17 15:01	
EPA 300.0	Sulfate	1.6	mg/L	1.2	06/03/17 15:01	B
EPA 353.2	Nitrogen, NO2 plus NO3	0.093	mg/L	0.020	06/09/17 14:40	
SM 5310C	Total Organic Carbon	1.0	mg/L	1.0	06/07/17 23:26	
<b>10390956003</b>	<b>MW1S-GW-060217</b>					
RSK 175	Methane	1.7J	ug/L	10.0	06/07/17 13:02	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10390956003</b>	<b>MW1S-GW-060217</b>					
6010C Met	Aluminum, Dissolved	36.8J	ug/L	200	06/09/17 10:08	
6010C Met	Barium, Dissolved	294	ug/L	10.0	06/09/17 10:08	
6010C Met	Calcium, Dissolved	117000	ug/L	500	06/09/17 10:08	
6010C Met	Chromium, Dissolved	4.1J	ug/L	10.0	06/09/17 10:08	
6010C Met	Cobalt, Dissolved	2.4J	ug/L	10.0	06/09/17 10:08	
6010C Met	Copper, Dissolved	2.2J	ug/L	10.0	06/09/17 10:08	
6010C Met	Iron, Dissolved	87.8	ug/L	50.0	06/09/17 10:08	
6010C Met	Lead, Dissolved	2.7J	ug/L	10.0	06/09/17 10:08	
6010C Met	Magnesium, Dissolved	31900	ug/L	500	06/09/17 10:08	
6010C Met	Manganese, Dissolved	251	ug/L	5.0	06/09/17 10:08	
6010C Met	Nickel, Dissolved	3.8J	ug/L	20.0	06/09/17 10:08	
6010C Met	Potassium, Dissolved	548J	ug/L	2500	06/09/17 10:08	
6010C Met	Sodium, Dissolved	46800	ug/L	1000	06/09/17 10:08	
6010C Met	Thallium, Dissolved	7.0J	ug/L	20.0	06/09/17 10:08	
6010C Met	Vanadium, Dissolved	5.1J	ug/L	15.0	06/09/17 10:08	
6010C Met	Zinc, Dissolved	74.4	ug/L	20.0	06/09/17 10:08	
SM 2320B	Alkalinity, Total as CaCO3	475	mg/L	5.0	06/10/17 14:46	
SM 2540C	Total Dissolved Solids	561	mg/L	10.0	06/07/17 13:20	
EPA 300.0	Chloride	7.8	mg/L	1.2	06/03/17 15:16	
EPA 300.0	Nitrate as N	0.055J	mg/L	0.10	06/03/17 15:16	
EPA 300.0	Sulfate	14.9	mg/L	1.2	06/03/17 15:16	
EPA 353.2	Nitrogen, NO2 plus NO3	0.025	mg/L	0.020	06/09/17 14:41	
SM 5310C	Total Organic Carbon	3.4	mg/L	1.0	06/07/17 23:40	
<b>10390956004</b>	<b>MW9S-GW-060217</b>					
RSK 175	Methane	1.5J	ug/L	10.0	06/07/17 13:24	
6010C Met	Aluminum, Dissolved	219	ug/L	200	06/09/17 10:10	
6010C Met	Barium, Dissolved	77.3	ug/L	10.0	06/09/17 10:10	
6010C Met	Cadmium, Dissolved	1.7J	ug/L	3.0	06/09/17 10:10	
6010C Met	Calcium, Dissolved	68200	ug/L	500	06/09/17 10:10	
6010C Met	Cobalt, Dissolved	0.58J	ug/L	10.0	06/09/17 10:10	
6010C Met	Copper, Dissolved	0.98J	ug/L	10.0	06/09/17 10:10	
6010C Met	Iron, Dissolved	451	ug/L	50.0	06/09/17 10:10	
6010C Met	Lead, Dissolved	2.4J	ug/L	10.0	06/09/17 10:10	
6010C Met	Magnesium, Dissolved	15500	ug/L	500	06/09/17 10:10	
6010C Met	Manganese, Dissolved	89.8	ug/L	5.0	06/09/17 10:10	
6010C Met	Potassium, Dissolved	1320J	ug/L	2500	06/09/17 10:10	
6010C Met	Sodium, Dissolved	14200	ug/L	1000	06/09/17 10:10	
6010C Met	Thallium, Dissolved	6.7J	ug/L	20.0	06/09/17 10:10	
6010C Met	Vanadium, Dissolved	2.5J	ug/L	15.0	06/09/17 10:10	
6010C Met	Zinc, Dissolved	27.3	ug/L	20.0	06/09/17 10:10	
SM 2320B	Alkalinity, Total as CaCO3	83.9	mg/L	5.0	06/10/17 14:50	
SM 2540C	Total Dissolved Solids	523	mg/L	10.0	06/07/17 13:20	
SM 4500-S-2 D	Sulfide, Total	0.0075J	mg/L	0.020	06/07/17 09:34	
EPA 300.0	Chloride	31.7	mg/L	1.2	06/03/17 15:31	
EPA 300.0	Nitrate as N	35.4	mg/L	0.50	06/03/17 22:25	
EPA 300.0	Sulfate	79.1	mg/L	1.2	06/03/17 15:31	
EPA 353.2	Nitrogen, NO2 plus NO3	15.1	mg/L	0.20	06/09/17 15:15	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390956004</b>	<b>MW9S-GW-060217</b>					
EPA 410.4	Chemical Oxygen Demand	17.5J	mg/L	50.0	06/15/17 08:37	
SM 5310C	Total Organic Carbon	1.4	mg/L	1.0	06/08/17 00:19	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

### General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 477706

B: Analyte was detected in the associated method blank.

- BLANK for HBN 477706 [WETA/312 (Lab ID: 2603221)
  - Chloride
  - Sulfate

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 477706

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390958001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2603223)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2603224)
  - Nitrate as N
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479521

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390953015, 10390953016

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2611895)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2611896)
  - Chemical Oxygen Demand

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** July 17, 2017

**General Information:**

4 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

**Sample: MW8S-GW-060217**      **Lab ID: 10390956001**      Collected: 06/02/17 10:15      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<b>&lt;4.9</b>	ug/L	10.0	4.9	1		06/07/17 12:48	74-84-0	
Ethene	<b>&lt;0.68</b>	ug/L	10.0	0.68	1		06/07/17 12:48	74-85-1	
Methane	<b>2.0J</b>	ug/L	10.0	1.1	1		06/07/17 12:48	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	<b>96.2J</b>	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:02	7429-90-5	
Antimony, Dissolved	<b>&lt;2.5</b>	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:02	7440-36-0	
Arsenic, Dissolved	<b>&lt;2.5</b>	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:02	7440-38-2	
Barium, Dissolved	<b>43.6</b>	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:02	7440-39-3	
Beryllium, Dissolved	<b>&lt;0.064</b>	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:02	7440-41-7	
Cadmium, Dissolved	<b>&lt;0.30</b>	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:02	7440-43-9	
Calcium, Dissolved	<b>46000</b>	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:02	7440-70-2	
Chromium, Dissolved	<b>&lt;2.0</b>	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:02	7440-47-3	
Cobalt, Dissolved	<b>&lt;0.51</b>	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:02	7440-48-4	
Copper, Dissolved	<b>2.1J</b>	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:02	7440-50-8	
Iron, Dissolved	<b>204</b>	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:02	7439-89-6	
Lead, Dissolved	<b>3.0J</b>	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:02	7439-92-1	
Magnesium, Dissolved	<b>10900</b>	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:02	7439-95-4	
Manganese, Dissolved	<b>76.8</b>	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:02	7439-96-5	
Nickel, Dissolved	<b>2.1J</b>	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:02	7440-02-0	
Potassium, Dissolved	<b>473J</b>	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:02	7440-09-7	
Selenium, Dissolved	<b>&lt;4.5</b>	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:02	7782-49-2	
Silver, Dissolved	<b>&lt;0.28</b>	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:02	7440-22-4	
Sodium, Dissolved	<b>13700</b>	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:02	7440-23-5	
Thallium, Dissolved	<b>4.1J</b>	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:02	7440-28-0	
Vanadium, Dissolved	<b>2.0J</b>	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:02	7440-62-2	
Zinc, Dissolved	<b>31.9</b>	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:02	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<b>&lt;0.062</b>	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:52	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>131</b>	mg/L	5.0	1.4	1		06/10/17 14:24		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>289</b>	mg/L	10.0	5.0	1		06/07/17 13:20		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<b>0.0063J</b>	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.9</b>	mg/L	1.2	0.10	1		06/03/17 14:46	16887-00-6	
Nitrate as N	<b>7.7</b>	mg/L	0.10	0.013	1		06/03/17 14:46	14797-55-8	
Sulfate	<b>19.6</b>	mg/L	1.2	0.16	1		06/03/17 14:46	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Sample: MW8S-GW-060217**      **Lab ID: 10390956001**      Collected: 06/02/17 10:15      Received: 06/03/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>7.8</b>	mg/L	0.20	0.075	10		06/09/17 15:09		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 12:04	06/15/17 08:36		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.6</b>	mg/L	1.0	0.20	1		06/07/17 23:13	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

**Sample: MW6S-GW-060217**      **Lab ID: 10390956002**      Collected: 06/02/17 11:05      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 12:55	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 12:55	74-85-1	
Methane	2.0J	ug/L	10.0	1.1	1		06/07/17 12:55	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:05	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:05	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:05	7440-38-2	
Barium, Dissolved	43.1	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:05	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:05	7440-41-7	
Cadmium, Dissolved	0.81J	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:05	7440-43-9	
Calcium, Dissolved	36000	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:05	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:05	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:05	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:05	7440-50-8	
Iron, Dissolved	18.5J	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:05	7439-89-6	
Lead, Dissolved	2.4J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:05	7439-92-1	
Magnesium, Dissolved	10000	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:05	7439-95-4	
Manganese, Dissolved	3.4J	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:05	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:05	7440-02-0	
Potassium, Dissolved	627J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:05	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:05	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:05	7440-22-4	
Sodium, Dissolved	12100	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:05	7440-23-5	
Thallium, Dissolved	4.2J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:05	7440-28-0	
Vanadium, Dissolved	5.0J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:05	7440-62-2	
Zinc, Dissolved	8.9J	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:05	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:55	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	148	mg/L	5.0	1.4	1		06/10/17 14:28		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	208	mg/L	10.0	5.0	1		06/07/17 13:20		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.4	mg/L	1.2	0.10	1		06/03/17 15:01	16887-00-6	B
Nitrate as N	0.098J	mg/L	0.10	0.013	1		06/03/17 15:01	14797-55-8	
Sulfate	1.6	mg/L	1.2	0.16	1		06/03/17 15:01	14808-79-8	B

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Sample: MW6S-GW-060217**      **Lab ID: 10390956002**      Collected: 06/02/17 11:05      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.093</b>	mg/L	0.020	0.0075	1		06/09/17 14:40		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 12:04	06/15/17 08:36		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>1.0</b>	mg/L	1.0	0.20	1		06/07/17 23:26	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

**Sample: MW1S-GW-060217**      **Lab ID: 10390956003**      Collected: 06/02/17 11:45      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 13:02	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 13:02	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		06/07/17 13:02	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	36.8J	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:08	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:08	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:08	7440-38-2	
Barium, Dissolved	294	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:08	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:08	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:08	7440-43-9	
Calcium, Dissolved	117000	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:08	7440-70-2	
Chromium, Dissolved	4.1J	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:08	7440-47-3	
Cobalt, Dissolved	2.4J	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:08	7440-48-4	
Copper, Dissolved	2.2J	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:08	7440-50-8	
Iron, Dissolved	87.8	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:08	7439-89-6	
Lead, Dissolved	2.7J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:08	7439-92-1	
Magnesium, Dissolved	31900	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:08	7439-95-4	
Manganese, Dissolved	251	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:08	7439-96-5	
Nickel, Dissolved	3.8J	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:08	7440-02-0	
Potassium, Dissolved	548J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:08	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:08	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:08	7440-22-4	
Sodium, Dissolved	46800	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:08	7440-23-5	
Thallium, Dissolved	7.0J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:08	7440-28-0	
Vanadium, Dissolved	5.1J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:08	7440-62-2	
Zinc, Dissolved	74.4	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:08	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:57	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	475	mg/L	5.0	1.4	1		06/10/17 14:46		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	561	mg/L	10.0	5.0	1		06/07/17 13:20		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.8	mg/L	1.2	0.10	1		06/03/17 15:16	16887-00-6	
Nitrate as N	0.055J	mg/L	0.10	0.013	1		06/03/17 15:16	14797-55-8	
Sulfate	14.9	mg/L	1.2	0.16	1		06/03/17 15:16	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Sample: MW1S-GW-060217**      **Lab ID: 10390956003**      Collected: 06/02/17 11:45      Received: 06/03/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.025</b>	mg/L	0.020	0.0075	1		06/09/17 14:41		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 12:04	06/15/17 08:37		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>3.4</b>	mg/L	1.0	0.20	1		06/07/17 23:40	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Sample: **MW9S-GW-060217** Lab ID: **10390956004** Collected: 06/02/17 12:25 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 13:24	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 13:24	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		06/07/17 13:24	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	219	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:10	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:10	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:10	7440-38-2	
Barium, Dissolved	77.3	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:10	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:10	7440-41-7	
Cadmium, Dissolved	1.7J	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:10	7440-43-9	
Calcium, Dissolved	68200	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:10	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:10	7440-47-3	
Cobalt, Dissolved	0.58J	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:10	7440-48-4	
Copper, Dissolved	0.98J	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:10	7440-50-8	
Iron, Dissolved	451	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:10	7439-89-6	
Lead, Dissolved	2.4J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:10	7439-92-1	
Magnesium, Dissolved	15500	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:10	7439-95-4	
Manganese, Dissolved	89.8	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:10	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:10	7440-02-0	
Potassium, Dissolved	1320J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:10	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:10	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:10	7440-22-4	
Sodium, Dissolved	14200	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:10	7440-23-5	
Thallium, Dissolved	6.7J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:10	7440-28-0	
Vanadium, Dissolved	2.5J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:10	7440-62-2	
Zinc, Dissolved	27.3	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:10	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:59	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	83.9	mg/L	5.0	1.4	1		06/10/17 14:50		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	523	mg/L	10.0	5.0	1		06/07/17 13:20		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0075J	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	31.7	mg/L	1.2	0.10	1		06/03/17 15:31	16887-00-6	
Nitrate as N	35.4	mg/L	0.50	0.065	5		06/03/17 22:25	14797-55-8	
Sulfate	79.1	mg/L	1.2	0.16	1		06/03/17 15:31	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

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**Sample: MW9S-GW-060217**      **Lab ID: 10390956004**      Collected: 06/02/17 12:25      Received: 06/03/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>15.1</b>	mg/L	0.20	0.075	10		06/09/17 15:15		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>17.5J</b>	mg/L	50.0	15.8	1	06/14/17 12:04	06/15/17 08:37		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.4</b>	mg/L	1.0	0.20	1		06/08/17 00:19	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

QC Batch: 478256 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10390956001, 10390956002, 10390956003

METHOD BLANK: 2605615 Matrix: Water  
Associated Lab Samples: 10390956001, 10390956002, 10390956003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/07/17 10:12	
Ethene	ug/L	<0.68	10.0	0.68	06/07/17 10:12	
Methane	ug/L	1.5J	10.0	1.1	06/07/17 10:12	

LABORATORY CONTROL SAMPLE & LCSD: 2605616

Parameter	Units	2605617		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Ethane	ug/L	114	109	96	96	85-115	0	20	
Ethene	ug/L	106	103	97	96	85-115	1	20	
Methane	ug/L	60.7	57.9	95	95	85-115	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2605619

Parameter	Units	60245647006		2605620		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Ethane	ug/L	ND	114	115	79.9	101	70	30-150	36	20	R1
Ethene	ug/L	ND	106	108	76.3	101	72	30-150	34	20	R1
Methane	ug/L	2.2J	60.7	62.0	43.7	99	68	30-150	35	20	R1

SAMPLE DUPLICATE: 2605618

Parameter	Units	10391003001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	0.80J	<0.68		20	
Methane	ug/L	<1.1	3.9J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

QC Batch: 478257 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10390956004

METHOD BLANK: 2605621 Matrix: Water  
Associated Lab Samples: 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/07/17 13:17	
Ethene	ug/L	<0.68	10.0	0.68	06/07/17 13:17	
Methane	ug/L	1.5J	10.0	1.1	06/07/17 13:17	

LABORATORY CONTROL SAMPLE & LCSD: 2605622

Parameter	Units	2605623								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	109	102	96	90	85-115	6	20	
Ethene	ug/L	106	102	95.8	96	90	85-115	6	20	
Methane	ug/L	60.7	57.4	53.6	95	88	85-115	7	20	

SAMPLE DUPLICATE: 2605624

Parameter	Units	10390956004		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.5J	<1.1		20	

SAMPLE DUPLICATE: 2605625

Parameter	Units	10390984017		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	4.7J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

QC Batch: 478518 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2606985 Matrix: Water  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/12/17 14:29	

LABORATORY CONTROL SAMPLE: 2606986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606987 2606988

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.7	4.6	95	93	80-120	2	20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

QC Batch: 478400 Analysis Method: 6010C Met  
 QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
 Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2606177 Matrix: Water  
 Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/09/17 09:24	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/09/17 09:24	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/09/17 09:24	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/09/17 09:24	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/09/17 09:24	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/09/17 09:24	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/09/17 09:24	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/09/17 09:24	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/09/17 09:24	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/09/17 09:24	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/09/17 09:24	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/09/17 09:24	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/09/17 09:24	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/09/17 09:24	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/09/17 09:24	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/09/17 09:24	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/09/17 09:24	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/09/17 09:24	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/09/17 09:24	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/09/17 09:24	

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21000	105	80-120	
Antimony, Dissolved	ug/L	1000	1060	106	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1030	103	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19900	99	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1000	100	80-120	
Iron, Dissolved	ug/L	20000	20200	101	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	500	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606181 2606182

Parameter	Units	10390958001		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Aluminum, Dissolved	ug/L	<13.5	20000	20000	21200	21700	106	109	75-125	2	20			
Antimony, Dissolved	ug/L	<2.5	1000	1000	1060	1070	106	107	75-125	1	20			
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1040	1060	104	106	75-125	2	20			
Barium, Dissolved	ug/L	36.8	1000	1000	1070	1080	103	105	75-125	1	20			
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1050	1070	105	107	75-125	2	20			
Cadmium, Dissolved	ug/L	<0.30	1000	1000	1030	1050	103	105	75-125	2	20			
Calcium, Dissolved	ug/L	34800	20000	20000	54400	55000	98	101	75-125	1	20			
Chromium, Dissolved	ug/L	<2.0	1000	1000	1010	1040	101	103	75-125	2	20			
Cobalt, Dissolved	ug/L	<0.51	1000	1000	1000	1020	100	102	75-125	2	20			
Copper, Dissolved	ug/L	227	1000	1000	1240	1260	101	103	75-125	2	20			
Iron, Dissolved	ug/L	<18.0	20000	20000	20200	20700	101	104	75-125	2	20			
Lead, Dissolved	ug/L	2.7J	1000	1000	1030	1050	103	105	75-125	2	20			
Magnesium, Dissolved	ug/L	12200	20000	20000	32600	33000	102	104	75-125	1	20			
Manganese, Dissolved	ug/L	0.50J	1000	1000	1030	1050	103	105	75-125	2	20			
Nickel, Dissolved	ug/L	<1.6	1000	1000	1010	1030	101	103	75-125	2	20			
Potassium, Dissolved	ug/L	1730J	20000	20000	22500	22700	104	105	75-125	1	20			
Selenium, Dissolved	ug/L	<4.5	1000	1000	1080	1090	107	109	75-125	2	20			
Silver, Dissolved	ug/L	<0.28	500	500	508	515	102	103	75-125	1	20			
Sodium, Dissolved	ug/L	18100	20000	20000	38100	38200	100	100	75-125	0	20			
Thallium, Dissolved	ug/L	5.0J	1000	1000	1010	1040	100	103	75-125	3	20			
Vanadium, Dissolved	ug/L	6.3J	1000	1000	1010	1020	100	102	75-125	2	20			
Zinc, Dissolved	ug/L	189	1000	1000	1180	1210	100	102	75-125	2	20			

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

QC Batch: 479020 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2609847 Matrix: Water  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/10/17 13:47	

LABORATORY CONTROL SAMPLE & LCSD: 2609848 2609849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	41.4	41.5	104	104	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609850 2609851

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	106	40	40	143	145	92	99	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609852 2609853

Parameter	Units	10391083002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	94.9	40	40	141	136	115	103	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

QC Batch: 478268 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2605649 Matrix: Water  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/07/17 13:20	

LABORATORY CONTROL SAMPLE: 2605650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 2605651

Parameter	Units	10391063015 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	333	332	0	10	

SAMPLE DUPLICATE: 2605652

Parameter	Units	10391063017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	282	284	1	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

QC Batch: 82033 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 348613 Matrix: Water  
 Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/07/17 09:32	

LABORATORY CONTROL SAMPLE: 348614

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 348616

Parameter	Units	10390833004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	102	75-125	

SAMPLE DUPLICATE: 348615

Parameter	Units	10390833004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

QC Batch: 477706 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2603221 Matrix: Water  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.37J	1.2	0.10	06/03/17 14:16	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/03/17 14:16	
Sulfate	mg/L	0.35J	1.2	0.16	06/03/17 14:16	

LABORATORY CONTROL SAMPLE: 2603222

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	99	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	11.8	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2603223 2603224

Parameter	Units	2603223		2603224		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	1.4	12.5	12.5	13.1	93	93	90-110	0	20	
Nitrate as N	mg/L	17.0	5	5	20.7	73	72	90-110	0	20 M1	
Sulfate	mg/L	11.1	12.5	12.5	21.2	80	80	90-110	0	20 M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

QC Batch: 478945 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2609246 Matrix: Water  
Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/09/17 15:06	

LABORATORY CONTROL SAMPLE: 2609247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609248 2609249

Parameter	Units	2609248		2609249		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10390956001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	17.8	17.1	100	94	90-110	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609250 2609251

Parameter	Units	2609250		2609251		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10391312005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Nitrogen, NO2 plus NO3	mg/L	0.67	1	1	1.6	1.6	96	93	90-110	2	20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

QC Batch: 479521 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 2611893 Matrix: Water  
 Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/15/17 08:33	

LABORATORY CONTROL SAMPLE: 2611894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	302	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611895 2611896

Parameter	Units	10390953015		2611895		2611896		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chemical Oxygen Demand	mg/L	85800	25000	25000	107000	105000	84	78	90-110	1	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611897 2611898

Parameter	Units	10390953016		2611897		2611898		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chemical Oxygen Demand	mg/L	214000	250000	250000	463000	455000	99	96	90-110	2	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

QC Batch: 115713

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

METHOD BLANK: 456470

Matrix: Water

Associated Lab Samples: 10390956001, 10390956002, 10390956003, 10390956004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/07/17 21:40	

LABORATORY CONTROL SAMPLE: 456471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.6	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456472 456473

Parameter	Units	10390831004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	0.42J	25	25	25.8	26.4	102	104	80-120	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

## QUALIFIERS

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10390956

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10390956

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10390956001	MW8S-GW-060217	RSK 175	478256		
10390956002	MW6S-GW-060217	RSK 175	478256		
10390956003	MW1S-GW-060217	RSK 175	478256		
10390956004	MW9S-GW-060217	RSK 175	478257		
10390956001	MW8S-GW-060217	EPA 3010	478400	6010C Met	478860
10390956002	MW6S-GW-060217	EPA 3010	478400	6010C Met	478860
10390956003	MW1S-GW-060217	EPA 3010	478400	6010C Met	478860
10390956004	MW9S-GW-060217	EPA 3010	478400	6010C Met	478860
10390956001	MW8S-GW-060217	EPA 7470A	478518	EPA 7470A	479036
10390956002	MW6S-GW-060217	EPA 7470A	478518	EPA 7470A	479036
10390956003	MW1S-GW-060217	EPA 7470A	478518	EPA 7470A	479036
10390956004	MW9S-GW-060217	EPA 7470A	478518	EPA 7470A	479036
10390956001	MW8S-GW-060217	SM 2320B	479020		
10390956002	MW6S-GW-060217	SM 2320B	479020		
10390956003	MW1S-GW-060217	SM 2320B	479020		
10390956004	MW9S-GW-060217	SM 2320B	479020		
10390956001	MW8S-GW-060217	SM 2540C	478268		
10390956002	MW6S-GW-060217	SM 2540C	478268		
10390956003	MW1S-GW-060217	SM 2540C	478268		
10390956004	MW9S-GW-060217	SM 2540C	478268		
10390956001	MW8S-GW-060217	SM 4500-S-2 D	82033		
10390956002	MW6S-GW-060217	SM 4500-S-2 D	82033		
10390956003	MW1S-GW-060217	SM 4500-S-2 D	82033		
10390956004	MW9S-GW-060217	SM 4500-S-2 D	82033		
10390956001	MW8S-GW-060217	EPA 300.0	477706		
10390956002	MW6S-GW-060217	EPA 300.0	477706		
10390956003	MW1S-GW-060217	EPA 300.0	477706		
10390956004	MW9S-GW-060217	EPA 300.0	477706		
10390956001	MW8S-GW-060217	EPA 353.2	478945		
10390956002	MW6S-GW-060217	EPA 353.2	478945		
10390956003	MW1S-GW-060217	EPA 353.2	478945		
10390956004	MW9S-GW-060217	EPA 353.2	478945		
10390956001	MW8S-GW-060217	EPA 410.4	479521	EPA 410.4	479700
10390956002	MW6S-GW-060217	EPA 410.4	479521	EPA 410.4	479700
10390956003	MW1S-GW-060217	EPA 410.4	479521	EPA 410.4	479700
10390956004	MW9S-GW-060217	EPA 410.4	479521	EPA 410.4	479700
10390956001	MW8S-GW-060217	SM 5310C	115713		
10390956002	MW6S-GW-060217	SM 5310C	115713		
10390956003	MW1S-GW-060217	SM 5310C	115713		
10390956004	MW9S-GW-060217	SM 5310C	115713		

### REPORT OF LABORATORY ANALYSIS

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10390956

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	Page: <span style="border: 1px solid black; padding: 2px;">1</span> Of <span style="border: 1px solid black; padding: 2px;">1</span>
Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman	<b>Regulatory Agency</b>
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR	
Email: mark.Ochsner@ch2n.com	Purchase Order #:	Address: CAS	<b>State / Location</b>
Phone: Fax	Project Name: UPRR_Freeman	Pace Quote:	
Requested Due Date/Circle: 10 Day Standard	Project #: 1497	Pace Profile #: 36447 / 4	<b>WA / Freeman</b>

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Y/N	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	NaOH + Zn Acetate	Na2S2O3	Other		Analyses Test	Low Level VOCs by 8280	60107470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethane RSK175	COD 410.4	Nitrate+Nitrite 353.2		
1	MW8S-GW-060217				WA			6-2-17	10:45		9																						
2	MWGS-GW-060217								11:05																								
3	MWIS-GW-060217								11:45																								
4	MW9S-GW-060217								12:25																								
5																																	
6																																	
7																																	
8																																	
9																																	
10																																	
11																																	
12																																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Short hold analyses are in bold	AT/IC/DM	6-2-17	15:00	Steve Demus	6/3/17	9:15	4.6	Y	Y	Y	Y

SAMPLER NAME AND SIGNATURE:		TEMP in C Received on Ice (Y/N) Custody Sealed Cooler (Y/N) Samples Intact (Y/N)
PRINT Name of SAMPLER: Steve Demus		
SIGNATURE of SAMPLER: <i>Steve Demus</i>	DATE Signed: 6-2-17	

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M Hill UPR

**Project #:**

**WO# : 10390956**



**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
**Tracking Number:** 7222 2739 9102

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: PB **Temp Blank?**  Yes  No

**Thermometer Used:**  151401163  151401164 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 4.5 **Cooler Temp Corrected (°C):** 4.6 **Biological Tissue Frozen?**  Yes  No  N/A

**Temp should be above freezing to 6°C** **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** Rb 6/3/17

**USDA Regulated Soil** ( N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res Chlorine? <input checked="" type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # <u>1-4</u>
Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>MWIS 1 vial has headspace</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>RSK has NO headspace</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>only 2 trip blanks</u>
Pace Trip Blank Lot # (if purchased): <u>02042417-3CVR</u>	

**CLIENT NOTIFICATION/RESOLUTION**

**Field Data Required?**  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>10:47</u>	Temp: <u>4.5</u>	Corrected Temp: <u>4.6</u>
Time: <u>10:57</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

**Date:** 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



# Chain of Custody

**WO# : 2055632**



**Workorder:** 10390956

**Workorder Name:** 1497 UPRR\_Freeman

**Owner Received Date:** 06/02/17

**Results Requested By:** 6/19/2017

Report To		Subcontract To					Requested Analysis																							
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers						LAB USE ONLY																		
						Other																								
1	MW85-GW-060217	PS	6/2/2017 10:15	10390956001	Water	1																								
2	MW6S-GW-060217	PS	6/2/2017 11:05	10390956002	Water	1																								
3	MW1S-GW-060217	PS	6/2/2017 11:45	10390956003	Water	1																								
4	MW9S-GW-060217	PS	6/2/2017 12:25	10390956004	Water	1																								
5																														

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>[Signature]</i> Pace MN	6/5/17 1315																
Fed Ex	6/6/17 915	J. Z. PAC	6/6/17 915														

Cooler Temperature on Receipt 3.4 °C      Custody Seal (Y) or N      Received on Ice (Y) or N      Samples Intact (Y) or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Sample Condition Upon Receipt

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

WO#: 2055632

PM: CMM

Due Date: 06/20/17

CLIENT: PASI-MINN

Project \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:

- Therm Fisher IR 5
- Therm Fisher IR 6
- Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-06-17 NJ

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

**WO# 1288656**

PM: HRZ Due Date: 06/19/17  
 CLIENT: PAGE MPLS



Page 1 of 46

Workorder: 10390956

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/3/2017

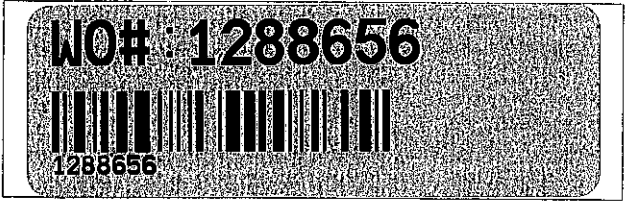
Results Requested By: 6/19/2017

Report To		Subcontract To					Requested Analysis																														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; justify-content: space-between;"> <span>5632354 / 5310 TOC</span> <span>LAB USE ONLY</span> </div>																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																															
						H2SO4																															
1	MW85-GW-060217	PS	6/2/2017 10:15	10390956001	Water	2																															
2	MW6S-GW-060217	PS	6/2/2017 11:05	10390956002	Water	2																															
3	MW1S-GW-060217	PS	6/2/2017 11:45	10390956003	Water	2																															
4	MW9S-GW-060217	PS	6/2/2017 12:25	10390956004	Water	2																															
5																																					
Transfers												Comments																									
Released By	Date/Time	Received By	Date/Time																																		
<i>[Signature]</i> Pace MN	6/5/17 13:15	<i>[Signature]</i>	6/5/17 17:30																																		
<i>[Signature]</i>	6/5/17 21:37	<i>[Signature]</i>	6/7/17 08:50																																		
Cooler Temperature on Receipt 1.4 °C		Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N																													

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace-MV Project #: \_\_\_\_\_



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Loz Pac Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.1 Cooler Temp Corrected °C: 1.4 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: JPC 6/5/17

Comments: not to be 17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>CLOT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 6.6.17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 09, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

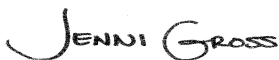
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
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Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
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## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390957001	MW8S-GW-060217	Water	06/02/17 10:15	06/03/17 09:15
10390957002	MW6S-GW-060217	Water	06/02/17 11:05	06/03/17 09:15
10390957003	MW1S-GW-060217	Water	06/02/17 11:45	06/03/17 09:15
10390957004	MW9S-GW-060217	Water	06/02/17 12:25	06/03/17 09:15
10390957005	Trip Blank	Water	06/02/17 00:00	06/03/17 09:15

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390957001	MW8S-GW-060217	EPA 8260B	DJB	83	PASI-M
10390957002	MW6S-GW-060217	EPA 8260B	DJB	83	PASI-M
10390957003	MW1S-GW-060217	EPA 8260B	DJB	83	PASI-M
10390957004	MW9S-GW-060217	EPA 8260B	DJB	83	PASI-M
10390957005	Trip Blank	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390957001</b>	<b>MW8S-GW-060217</b>					
EPA 8260B	Acetone	5.5J	ug/L	40.0	06/08/17 17:20	CH,L1
EPA 8260B	Carbon disulfide	1.2J	ug/L	2.0	06/08/17 17:20	
EPA 8260B	Carbon tetrachloride	190	ug/L	1.0	06/08/17 17:20	
EPA 8260B	Chloroform	49.5	ug/L	2.0	06/08/17 17:20	
EPA 8260B	Methylene Chloride	0.94J	ug/L	8.0	06/08/17 17:20	
<b>10390957002</b>	<b>MW6S-GW-060217</b>					
EPA 8260B	1,2,4-Trimethylbenzene	1.6	ug/L	0.50	06/08/17 18:04	
EPA 8260B	1,3,5-Trimethylbenzene	0.70	ug/L	0.50	06/08/17 18:04	
EPA 8260B	Toluene	0.095J	ug/L	1.0	06/08/17 18:04	
EPA 8260B	m&p-Xylene	0.18J	ug/L	1.0	06/08/17 18:04	
EPA 8260B	n-Propylbenzene	0.11J	ug/L	0.50	06/08/17 18:04	
EPA 8260B	o-Xylene	0.37J	ug/L	0.50	06/08/17 18:04	
<b>10390957003</b>	<b>MW1S-GW-060217</b>					
EPA 8260B	Chloromethane	0.74J	ug/L	4.0	06/08/17 18:25	
<b>10390957004</b>	<b>MW9S-GW-060217</b>					
EPA 8260B	Carbon disulfide	2.7J	ug/L	5.0	06/08/17 17:42	
EPA 8260B	Carbon tetrachloride	512	ug/L	2.5	06/08/17 17:42	
EPA 8260B	Chloroform	72.4	ug/L	5.0	06/08/17 17:42	
EPA 8260B	Methylene Chloride	3.3J	ug/L	20.0	06/08/17 17:42	
<b>10390957005</b>	<b>Trip Blank</b>					
EPA 8260B	Acetone	4.6J	ug/L	20.0	06/08/17 14:03	CH,L1
EPA 8260B	Chloroform	0.81J	ug/L	1.0	06/08/17 14:03	
EPA 8260B	Methylene Chloride	0.29J	ug/L	4.0	06/08/17 14:03	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 09, 2017

### General Information:

5 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 478598

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2607382)
  - Acetone
  - Tetrahydrofuran
- LCSD (Lab ID: 2607383)
  - Acetone
  - Tetrahydrofuran
- MS (Lab ID: 2607384)
  - Acetone
  - Tetrahydrofuran
- MW8S-GW-060217 (Lab ID: 10390957001)
  - Acetone
- Trip Blank (Lab ID: 10390957005)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 478598

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2607382)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 09, 2017

QC Batch: 478598

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- Acetone
- Tetrahydrofuran
- LCSD (Lab ID: 2607383)
  - Acetone
  - Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 478598

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

**Sample: MW8S-GW-060217**      **Lab ID: 10390957001**      Collected: 06/02/17 10:15      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.13	ug/L	1.0	0.13	2		06/08/17 17:20	630-20-6	
1,1,1-Trichloroethane	<0.11	ug/L	1.0	0.11	2		06/08/17 17:20	71-55-6	
1,1,2,2-Tetrachloroethane	<0.11	ug/L	1.0	0.11	2		06/08/17 17:20	79-34-5	
1,1,2-Trichloroethane	<0.13	ug/L	1.0	0.13	2		06/08/17 17:20	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.26	ug/L	2.0	0.26	2		06/08/17 17:20	76-13-1	
1,1-Dichloroethane	<0.11	ug/L	1.0	0.11	2		06/08/17 17:20	75-34-3	
1,1-Dichloroethene	<0.14	ug/L	1.0	0.14	2		06/08/17 17:20	75-35-4	
1,1-Dichloropropene	<0.16	ug/L	1.0	0.16	2		06/08/17 17:20	563-58-6	
1,2,3-Trichlorobenzene	<0.34	ug/L	1.0	0.34	2		06/08/17 17:20	87-61-6	
1,2,3-Trichloropropane	<0.38	ug/L	8.0	0.38	2		06/08/17 17:20	96-18-4	
1,2,4-Trichlorobenzene	<0.28	ug/L	1.0	0.28	2		06/08/17 17:20	120-82-1	
1,2,4-Trimethylbenzene	<0.14	ug/L	1.0	0.14	2		06/08/17 17:20	95-63-6	
1,2-Dibromo-3-chloropropane	<1.2	ug/L	8.0	1.2	2		06/08/17 17:20	96-12-8	
1,2-Dibromoethane (EDB)	<0.18	ug/L	1.0	0.18	2		06/08/17 17:20	106-93-4	
1,2-Dichlorobenzene	<0.16	ug/L	1.0	0.16	2		06/08/17 17:20	95-50-1	
1,2-Dichloroethane	<0.14	ug/L	1.0	0.14	2		06/08/17 17:20	107-06-2	
1,2-Dichloroethene (Total)	<0.33	ug/L	2.0	0.33	2		06/08/17 17:20	540-59-0	
1,2-Dichloropropane	<0.13	ug/L	8.0	0.13	2		06/08/17 17:20	78-87-5	
1,3,5-Trimethylbenzene	<0.084	ug/L	1.0	0.084	2		06/08/17 17:20	108-67-8	
1,3-Dichlorobenzene	<0.17	ug/L	1.0	0.17	2		06/08/17 17:20	541-73-1	
1,3-Dichloropropane	<0.12	ug/L	1.0	0.12	2		06/08/17 17:20	142-28-9	
1,4-Dichlorobenzene	<0.16	ug/L	1.0	0.16	2		06/08/17 17:20	106-46-7	
1,4-Dioxane (p-Dioxane)	<9.6	ug/L	400	9.6	2		06/08/17 17:20	123-91-1	
2,2,4-Trimethylpentane	<0.17	ug/L	8.0	0.17	2		06/08/17 17:20	540-84-1	
2,2-Dichloropropane	<0.19	ug/L	2.0	0.19	2		06/08/17 17:20	594-20-7	
2-Butanone (MEK)	<2.2	ug/L	10.0	2.2	2		06/08/17 17:20	78-93-3	
2-Chlorotoluene	<0.17	ug/L	1.0	0.17	2		06/08/17 17:20	95-49-8	
2-Hexanone	<0.38	ug/L	10.0	0.38	2		06/08/17 17:20	591-78-6	
4-Chlorotoluene	<0.096	ug/L	1.0	0.096	2		06/08/17 17:20	106-43-4	
4-Methyl-2-pentanone (MIBK)	<1.6	ug/L	10.0	1.6	2		06/08/17 17:20	108-10-1	
Acetone	5.5J	ug/L	40.0	1.3	2		06/08/17 17:20	67-64-1	CH,L1
Acrolein	<4.2	ug/L	20.0	4.2	2		06/08/17 17:20	107-02-8	
Acrylonitrile	<0.98	ug/L	20.0	0.98	2		06/08/17 17:20	107-13-1	
Benzene	<0.084	ug/L	1.0	0.084	2		06/08/17 17:20	71-43-2	
Bromobenzene	<0.17	ug/L	1.0	0.17	2		06/08/17 17:20	108-86-1	
Bromochloromethane	<0.16	ug/L	2.0	0.16	2		06/08/17 17:20	74-97-5	
Bromodichloromethane	<0.14	ug/L	1.0	0.14	2		06/08/17 17:20	75-27-4	
Bromoform	<0.22	ug/L	8.0	0.22	2		06/08/17 17:20	75-25-2	
Bromomethane	<0.40	ug/L	8.0	0.40	2		06/08/17 17:20	74-83-9	
Carbon disulfide	1.2J	ug/L	2.0	0.40	2		06/08/17 17:20	75-15-0	
Carbon tetrachloride	190	ug/L	1.0	0.16	2		06/08/17 17:20	56-23-5	
Chlorobenzene	<0.13	ug/L	1.0	0.13	2		06/08/17 17:20	108-90-7	
Chloroethane	<0.24	ug/L	2.0	0.24	2		06/08/17 17:20	75-00-3	
Chloroform	49.5	ug/L	2.0	0.42	2		06/08/17 17:20	67-66-3	
Chloromethane	<0.16	ug/L	8.0	0.16	2		06/08/17 17:20	74-87-3	
Dibromochloromethane	<0.096	ug/L	1.0	0.096	2		06/08/17 17:20	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

**Sample: MW8S-GW-060217**      **Lab ID: 10390957001**      Collected: 06/02/17 10:15      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.28	ug/L	2.0	0.28	2		06/08/17 17:20	74-95-3	
Dichlorodifluoromethane	<0.15	ug/L	2.0	0.15	2		06/08/17 17:20	75-71-8	
Dichlorofluoromethane	<0.11	ug/L	2.0	0.11	2		06/08/17 17:20	75-43-4	
Diisopropyl ether	<0.10	ug/L	2.0	0.10	2		06/08/17 17:20	108-20-3	
Ethyl-tert-butyl ether	<0.12	ug/L	1.0	0.12	2		06/08/17 17:20	637-92-3	
Ethylbenzene	<0.15	ug/L	1.0	0.15	2		06/08/17 17:20	100-41-4	
Hexachloro-1,3-butadiene	<0.26	ug/L	2.0	0.26	2		06/08/17 17:20	87-68-3	
Isopropylbenzene (Cumene)	<0.13	ug/L	1.0	0.13	2		06/08/17 17:20	98-82-8	
Methyl-tert-butyl ether	<0.094	ug/L	1.0	0.094	2		06/08/17 17:20	1634-04-4	
Methylene Chloride	0.94J	ug/L	8.0	0.19	2		06/08/17 17:20	75-09-2	
Naphthalene	<0.13	ug/L	2.0	0.13	2		06/08/17 17:20	91-20-3	
Styrene	<0.11	ug/L	1.0	0.11	2		06/08/17 17:20	100-42-5	
Tetrachloroethene	<0.26	ug/L	1.0	0.26	2		06/08/17 17:20	127-18-4	
Tetrahydrofuran	<3.0	ug/L	20.0	3.0	2		06/08/17 17:20	109-99-9	L3
Toluene	<0.12	ug/L	2.0	0.12	2		06/08/17 17:20	108-88-3	
Trichloroethene	<0.088	ug/L	0.80	0.088	2		06/08/17 17:20	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	1.0	0.11	2		06/08/17 17:20	75-69-4	
Vinyl acetate	<0.24	ug/L	20.0	0.24	2		06/08/17 17:20	108-05-4	
Vinyl chloride	<0.20	ug/L	0.40	0.20	2		06/08/17 17:20	75-01-4	
Xylene (Total)	<0.31	ug/L	3.0	0.31	2		06/08/17 17:20	1330-20-7	
cis-1,2-Dichloroethene	<0.24	ug/L	1.0	0.24	2		06/08/17 17:20	156-59-2	
cis-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	2		06/08/17 17:20	10061-01-5	
m&p-Xylene	<0.22	ug/L	2.0	0.22	2		06/08/17 17:20	179601-23-1	
n-Butylbenzene	<0.32	ug/L	1.0	0.32	2		06/08/17 17:20	104-51-8	
n-Propylbenzene	<0.098	ug/L	1.0	0.098	2		06/08/17 17:20	103-65-1	
o-Xylene	<0.088	ug/L	1.0	0.088	2		06/08/17 17:20	95-47-6	
p-Isopropyltoluene	<0.13	ug/L	1.0	0.13	2		06/08/17 17:20	99-87-6	
sec-Butylbenzene	<0.19	ug/L	1.0	0.19	2		06/08/17 17:20	135-98-8	
tert-Amylmethyl ether	<0.15	ug/L	1.0	0.15	2		06/08/17 17:20	994-05-8	
tert-Butyl Alcohol	<1.8	ug/L	20.0	1.8	2		06/08/17 17:20	75-65-0	
tert-Butylbenzene	<0.10	ug/L	1.0	0.10	2		06/08/17 17:20	98-06-6	
trans-1,2-Dichloroethene	<0.30	ug/L	1.0	0.30	2		06/08/17 17:20	156-60-5	
trans-1,3-Dichloropropene	<0.088	ug/L	1.0	0.088	2		06/08/17 17:20	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.90	ug/L	20.0	0.90	2		06/08/17 17:20	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		2		06/08/17 17:20	17060-07-0	
Toluene-d8 (S)	99	%	75-125		2		06/08/17 17:20	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		2		06/08/17 17:20	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Sample: **MW6S-GW-060217** Lab ID: **10390957002** Collected: 06/02/17 11:05 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 18:04	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/08/17 18:04	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 18:04	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 18:04	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/08/17 18:04	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 18:04	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/08/17 18:04	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/08/17 18:04	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/08/17 18:04	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/08/17 18:04	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/08/17 18:04	120-82-1	
1,2,4-Trimethylbenzene	1.6	ug/L	0.50	0.068	1		06/08/17 18:04	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/08/17 18:04	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/08/17 18:04	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/08/17 18:04	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/08/17 18:04	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/08/17 18:04	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/08/17 18:04	78-87-5	
1,3,5-Trimethylbenzene	0.70	ug/L	0.50	0.042	1		06/08/17 18:04	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/08/17 18:04	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/08/17 18:04	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/08/17 18:04	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/08/17 18:04	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/08/17 18:04	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/08/17 18:04	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/08/17 18:04	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/08/17 18:04	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/08/17 18:04	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/08/17 18:04	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/08/17 18:04	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/08/17 18:04	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/08/17 18:04	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/08/17 18:04	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/08/17 18:04	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/08/17 18:04	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/08/17 18:04	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/08/17 18:04	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/08/17 18:04	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/08/17 18:04	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/08/17 18:04	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/08/17 18:04	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/08/17 18:04	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/08/17 18:04	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/08/17 18:04	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/08/17 18:04	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/08/17 18:04	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Sample: **MW6S-GW-060217** Lab ID: **10390957002** Collected: 06/02/17 11:05 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/08/17 18:04	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/08/17 18:04	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/08/17 18:04	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/08/17 18:04	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/08/17 18:04	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/08/17 18:04	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/08/17 18:04	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/08/17 18:04	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/08/17 18:04	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/08/17 18:04	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/08/17 18:04	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/08/17 18:04	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/08/17 18:04	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/08/17 18:04	109-99-9	L3
Toluene	0.095J	ug/L	1.0	0.059	1		06/08/17 18:04	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/08/17 18:04	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/08/17 18:04	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/08/17 18:04	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/08/17 18:04	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/08/17 18:04	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/08/17 18:04	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/08/17 18:04	10061-01-5	
m&p-Xylene	0.18J	ug/L	1.0	0.11	1		06/08/17 18:04	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/08/17 18:04	104-51-8	
n-Propylbenzene	0.11J	ug/L	0.50	0.049	1		06/08/17 18:04	103-65-1	
o-Xylene	0.37J	ug/L	0.50	0.044	1		06/08/17 18:04	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/08/17 18:04	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/08/17 18:04	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/08/17 18:04	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/08/17 18:04	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/08/17 18:04	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/08/17 18:04	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/08/17 18:04	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/08/17 18:04	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		06/08/17 18:04	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/08/17 18:04	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		06/08/17 18:04	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Sample: **MW1S-GW-060217** Lab ID: **10390957003** Collected: 06/02/17 11:45 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 18:25	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/08/17 18:25	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 18:25	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 18:25	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/08/17 18:25	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 18:25	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/08/17 18:25	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/08/17 18:25	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/08/17 18:25	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/08/17 18:25	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/08/17 18:25	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/08/17 18:25	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/08/17 18:25	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/08/17 18:25	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/08/17 18:25	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/08/17 18:25	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/08/17 18:25	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/08/17 18:25	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/08/17 18:25	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/08/17 18:25	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/08/17 18:25	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/08/17 18:25	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/08/17 18:25	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/08/17 18:25	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/08/17 18:25	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/08/17 18:25	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/08/17 18:25	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/08/17 18:25	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/08/17 18:25	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/08/17 18:25	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/08/17 18:25	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/08/17 18:25	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/08/17 18:25	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/08/17 18:25	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/08/17 18:25	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/08/17 18:25	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/08/17 18:25	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/08/17 18:25	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/08/17 18:25	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/08/17 18:25	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/08/17 18:25	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/08/17 18:25	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/08/17 18:25	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/08/17 18:25	67-66-3	
Chloromethane	0.74J	ug/L	4.0	0.080	1		06/08/17 18:25	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/08/17 18:25	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

**Sample: MW1S-GW-060217**      **Lab ID: 10390957003**      Collected: 06/02/17 11:45      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/08/17 18:25	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/08/17 18:25	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/08/17 18:25	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/08/17 18:25	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/08/17 18:25	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/08/17 18:25	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/08/17 18:25	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/08/17 18:25	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/08/17 18:25	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/08/17 18:25	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/08/17 18:25	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/08/17 18:25	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/08/17 18:25	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/08/17 18:25	109-99-9	L3
Toluene	<0.059	ug/L	1.0	0.059	1		06/08/17 18:25	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/08/17 18:25	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/08/17 18:25	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/08/17 18:25	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/08/17 18:25	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/08/17 18:25	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/08/17 18:25	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/08/17 18:25	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/08/17 18:25	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/08/17 18:25	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/08/17 18:25	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/08/17 18:25	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/08/17 18:25	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/08/17 18:25	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/08/17 18:25	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/08/17 18:25	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/08/17 18:25	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/08/17 18:25	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/08/17 18:25	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/08/17 18:25	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		06/08/17 18:25	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/08/17 18:25	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/08/17 18:25	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Sample: **MW9S-GW-060217** Lab ID: **10390957004** Collected: 06/02/17 12:25 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.32	ug/L	2.5	0.32	5		06/08/17 17:42	630-20-6	
1,1,1-Trichloroethane	<0.28	ug/L	2.5	0.28	5		06/08/17 17:42	71-55-6	
1,1,2,2-Tetrachloroethane	<0.28	ug/L	2.5	0.28	5		06/08/17 17:42	79-34-5	
1,1,2-Trichloroethane	<0.32	ug/L	2.5	0.32	5		06/08/17 17:42	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.65	ug/L	5.0	0.65	5		06/08/17 17:42	76-13-1	
1,1-Dichloroethane	<0.28	ug/L	2.5	0.28	5		06/08/17 17:42	75-34-3	
1,1-Dichloroethene	<0.34	ug/L	2.5	0.34	5		06/08/17 17:42	75-35-4	
1,1-Dichloropropene	<0.41	ug/L	2.5	0.41	5		06/08/17 17:42	563-58-6	
1,2,3-Trichlorobenzene	<0.85	ug/L	2.5	0.85	5		06/08/17 17:42	87-61-6	
1,2,3-Trichloropropane	<0.95	ug/L	20.0	0.95	5		06/08/17 17:42	96-18-4	
1,2,4-Trichlorobenzene	<0.70	ug/L	2.5	0.70	5		06/08/17 17:42	120-82-1	
1,2,4-Trimethylbenzene	<0.34	ug/L	2.5	0.34	5		06/08/17 17:42	95-63-6	
1,2-Dibromo-3-chloropropane	<3.0	ug/L	20.0	3.0	5		06/08/17 17:42	96-12-8	
1,2-Dibromoethane (EDB)	<0.46	ug/L	2.5	0.46	5		06/08/17 17:42	106-93-4	
1,2-Dichlorobenzene	<0.39	ug/L	2.5	0.39	5		06/08/17 17:42	95-50-1	
1,2-Dichloroethane	<0.36	ug/L	2.5	0.36	5		06/08/17 17:42	107-06-2	
1,2-Dichloroethene (Total)	<0.82	ug/L	5.0	0.82	5		06/08/17 17:42	540-59-0	
1,2-Dichloropropane	<0.33	ug/L	20.0	0.33	5		06/08/17 17:42	78-87-5	
1,3,5-Trimethylbenzene	<0.21	ug/L	2.5	0.21	5		06/08/17 17:42	108-67-8	
1,3-Dichlorobenzene	<0.42	ug/L	2.5	0.42	5		06/08/17 17:42	541-73-1	
1,3-Dichloropropane	<0.30	ug/L	2.5	0.30	5		06/08/17 17:42	142-28-9	
1,4-Dichlorobenzene	<0.40	ug/L	2.5	0.40	5		06/08/17 17:42	106-46-7	
1,4-Dioxane (p-Dioxane)	<24.0	ug/L	1000	24.0	5		06/08/17 17:42	123-91-1	
2,2,4-Trimethylpentane	<0.44	ug/L	20.0	0.44	5		06/08/17 17:42	540-84-1	
2,2-Dichloropropane	<0.48	ug/L	5.0	0.48	5		06/08/17 17:42	594-20-7	
2-Butanone (MEK)	<5.5	ug/L	25.0	5.5	5		06/08/17 17:42	78-93-3	
2-Chlorotoluene	<0.42	ug/L	2.5	0.42	5		06/08/17 17:42	95-49-8	
2-Hexanone	<0.96	ug/L	25.0	0.96	5		06/08/17 17:42	591-78-6	
4-Chlorotoluene	<0.24	ug/L	2.5	0.24	5		06/08/17 17:42	106-43-4	
4-Methyl-2-pentanone (MIBK)	<4.0	ug/L	25.0	4.0	5		06/08/17 17:42	108-10-1	
Acetone	<3.2	ug/L	100	3.2	5		06/08/17 17:42	67-64-1	L3
Acrolein	<10.5	ug/L	50.0	10.5	5		06/08/17 17:42	107-02-8	
Acrylonitrile	<2.4	ug/L	50.0	2.4	5		06/08/17 17:42	107-13-1	
Benzene	<0.21	ug/L	2.5	0.21	5		06/08/17 17:42	71-43-2	
Bromobenzene	<0.44	ug/L	2.5	0.44	5		06/08/17 17:42	108-86-1	
Bromochloromethane	<0.41	ug/L	5.0	0.41	5		06/08/17 17:42	74-97-5	
Bromodichloromethane	<0.34	ug/L	2.5	0.34	5		06/08/17 17:42	75-27-4	
Bromoform	<0.55	ug/L	20.0	0.55	5		06/08/17 17:42	75-25-2	
Bromomethane	<1.0	ug/L	20.0	1.0	5		06/08/17 17:42	74-83-9	
Carbon disulfide	2.7J	ug/L	5.0	1.0	5		06/08/17 17:42	75-15-0	
Carbon tetrachloride	512	ug/L	2.5	0.40	5		06/08/17 17:42	56-23-5	
Chlorobenzene	<0.33	ug/L	2.5	0.33	5		06/08/17 17:42	108-90-7	
Chloroethane	<0.60	ug/L	5.0	0.60	5		06/08/17 17:42	75-00-3	
Chloroform	72.4	ug/L	5.0	1.0	5		06/08/17 17:42	67-66-3	
Chloromethane	<0.40	ug/L	20.0	0.40	5		06/08/17 17:42	74-87-3	
Dibromochloromethane	<0.24	ug/L	2.5	0.24	5		06/08/17 17:42	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

**Sample: MW9S-GW-060217**      **Lab ID: 10390957004**      Collected: 06/02/17 12:25      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.70	ug/L	5.0	0.70	5		06/08/17 17:42	74-95-3	
Dichlorodifluoromethane	<0.38	ug/L	5.0	0.38	5		06/08/17 17:42	75-71-8	
Dichlorofluoromethane	<0.27	ug/L	5.0	0.27	5		06/08/17 17:42	75-43-4	
Diisopropyl ether	<0.25	ug/L	5.0	0.25	5		06/08/17 17:42	108-20-3	
Ethyl-tert-butyl ether	<0.31	ug/L	2.5	0.31	5		06/08/17 17:42	637-92-3	
Ethylbenzene	<0.38	ug/L	2.5	0.38	5		06/08/17 17:42	100-41-4	
Hexachloro-1,3-butadiene	<0.65	ug/L	5.0	0.65	5		06/08/17 17:42	87-68-3	
Isopropylbenzene (Cumene)	<0.32	ug/L	2.5	0.32	5		06/08/17 17:42	98-82-8	
Methyl-tert-butyl ether	<0.24	ug/L	2.5	0.24	5		06/08/17 17:42	1634-04-4	
Methylene Chloride	3.3J	ug/L	20.0	0.48	5		06/08/17 17:42	75-09-2	
Naphthalene	<0.32	ug/L	5.0	0.32	5		06/08/17 17:42	91-20-3	
Styrene	<0.28	ug/L	2.5	0.28	5		06/08/17 17:42	100-42-5	
Tetrachloroethene	<0.65	ug/L	2.5	0.65	5		06/08/17 17:42	127-18-4	
Tetrahydrofuran	<7.5	ug/L	50.0	7.5	5		06/08/17 17:42	109-99-9	L3
Toluene	<0.30	ug/L	5.0	0.30	5		06/08/17 17:42	108-88-3	
Trichloroethene	<0.22	ug/L	2.0	0.22	5		06/08/17 17:42	79-01-6	
Trichlorofluoromethane	<0.28	ug/L	2.5	0.28	5		06/08/17 17:42	75-69-4	
Vinyl acetate	<0.60	ug/L	50.0	0.60	5		06/08/17 17:42	108-05-4	
Vinyl chloride	<0.49	ug/L	1.0	0.49	5		06/08/17 17:42	75-01-4	
Xylene (Total)	<0.77	ug/L	7.5	0.77	5		06/08/17 17:42	1330-20-7	
cis-1,2-Dichloroethene	<0.60	ug/L	2.5	0.60	5		06/08/17 17:42	156-59-2	
cis-1,3-Dichloropropene	<0.34	ug/L	2.5	0.34	5		06/08/17 17:42	10061-01-5	
m&p-Xylene	<0.55	ug/L	5.0	0.55	5		06/08/17 17:42	179601-23-1	
n-Butylbenzene	<0.80	ug/L	2.5	0.80	5		06/08/17 17:42	104-51-8	
n-Propylbenzene	<0.24	ug/L	2.5	0.24	5		06/08/17 17:42	103-65-1	
o-Xylene	<0.22	ug/L	2.5	0.22	5		06/08/17 17:42	95-47-6	
p-Isopropyltoluene	<0.32	ug/L	2.5	0.32	5		06/08/17 17:42	99-87-6	
sec-Butylbenzene	<0.47	ug/L	2.5	0.47	5		06/08/17 17:42	135-98-8	
tert-Amylmethyl ether	<0.36	ug/L	2.5	0.36	5		06/08/17 17:42	994-05-8	
tert-Butyl Alcohol	<4.4	ug/L	50.0	4.4	5		06/08/17 17:42	75-65-0	
tert-Butylbenzene	<0.26	ug/L	2.5	0.26	5		06/08/17 17:42	98-06-6	
trans-1,2-Dichloroethene	<0.75	ug/L	2.5	0.75	5		06/08/17 17:42	156-60-5	
trans-1,3-Dichloropropene	<0.22	ug/L	2.5	0.22	5		06/08/17 17:42	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.2	ug/L	50.0	2.2	5		06/08/17 17:42	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		5		06/08/17 17:42	17060-07-0	
Toluene-d8 (S)	98	%	75-125		5		06/08/17 17:42	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		5		06/08/17 17:42	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

**Sample: Trip Blank**      **Lab ID: 10390957005**      Collected: 06/02/17 00:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 14:03	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/08/17 14:03	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 14:03	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 14:03	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/08/17 14:03	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 14:03	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/08/17 14:03	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/08/17 14:03	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/08/17 14:03	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/08/17 14:03	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/08/17 14:03	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/08/17 14:03	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/08/17 14:03	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/08/17 14:03	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/08/17 14:03	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/08/17 14:03	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/08/17 14:03	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/08/17 14:03	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/08/17 14:03	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/08/17 14:03	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/08/17 14:03	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/08/17 14:03	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/08/17 14:03	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/08/17 14:03	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/08/17 14:03	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/08/17 14:03	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/08/17 14:03	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/08/17 14:03	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/08/17 14:03	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/08/17 14:03	108-10-1	
Acetone	4.6J	ug/L	20.0	0.64	1		06/08/17 14:03	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/08/17 14:03	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/08/17 14:03	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/08/17 14:03	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/08/17 14:03	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/08/17 14:03	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/08/17 14:03	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/08/17 14:03	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/08/17 14:03	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/08/17 14:03	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/08/17 14:03	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/08/17 14:03	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/08/17 14:03	75-00-3	
Chloroform	0.81J	ug/L	1.0	0.21	1		06/08/17 14:03	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/08/17 14:03	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/08/17 14:03	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

**Sample: Trip Blank**      **Lab ID: 10390957005**      Collected: 06/02/17 00:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/08/17 14:03	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/08/17 14:03	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/08/17 14:03	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/08/17 14:03	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/08/17 14:03	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/08/17 14:03	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/08/17 14:03	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/08/17 14:03	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/08/17 14:03	1634-04-4	
Methylene Chloride	0.29J	ug/L	4.0	0.097	1		06/08/17 14:03	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/08/17 14:03	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/08/17 14:03	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/08/17 14:03	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/08/17 14:03	109-99-9	L3
Toluene	<0.059	ug/L	1.0	0.059	1		06/08/17 14:03	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/08/17 14:03	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/08/17 14:03	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/08/17 14:03	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/08/17 14:03	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/08/17 14:03	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/08/17 14:03	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/08/17 14:03	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/08/17 14:03	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/08/17 14:03	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/08/17 14:03	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/08/17 14:03	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/08/17 14:03	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/08/17 14:03	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/08/17 14:03	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/08/17 14:03	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/08/17 14:03	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/08/17 14:03	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/08/17 14:03	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/08/17 14:03	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		06/08/17 14:03	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/08/17 14:03	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/08/17 14:03	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

QC Batch: 478598 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10390957001, 10390957002, 10390957003, 10390957004, 10390957005

METHOD BLANK: 2607381 Matrix: Water  
Associated Lab Samples: 10390957001, 10390957002, 10390957003, 10390957004, 10390957005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/08/17 13:18	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/08/17 13:18	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/08/17 13:18	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/08/17 13:18	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/08/17 13:18	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/08/17 13:18	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/08/17 13:18	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/08/17 13:18	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/08/17 13:18	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/08/17 13:18	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/08/17 13:18	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/08/17 13:18	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/08/17 13:18	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/08/17 13:18	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/08/17 13:18	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/08/17 13:18	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/08/17 13:18	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/08/17 13:18	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/08/17 13:18	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/08/17 13:18	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/08/17 13:18	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/08/17 13:18	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/08/17 13:18	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/08/17 13:18	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/08/17 13:18	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/08/17 13:18	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/08/17 13:18	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/08/17 13:18	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/08/17 13:18	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/08/17 13:18	
Acetone	ug/L	<0.64	20.0	0.64	06/08/17 13:18	
Acrolein	ug/L	<2.1	10.0	2.1	06/08/17 13:18	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/08/17 13:18	
Benzene	ug/L	<0.042	0.50	0.042	06/08/17 13:18	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/08/17 13:18	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/08/17 13:18	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/08/17 13:18	
Bromoform	ug/L	<0.11	4.0	0.11	06/08/17 13:18	
Bromomethane	ug/L	<0.20	4.0	0.20	06/08/17 13:18	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/08/17 13:18	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/08/17 13:18	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

METHOD BLANK: 2607381 Matrix: Water  
Associated Lab Samples: 10390957001, 10390957002, 10390957003, 10390957004, 10390957005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/08/17 13:18	
Chloroethane	ug/L	<0.12	1.0	0.12	06/08/17 13:18	
Chloroform	ug/L	<0.21	1.0	0.21	06/08/17 13:18	
Chloromethane	ug/L	<0.080	4.0	0.080	06/08/17 13:18	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/08/17 13:18	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/08/17 13:18	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/08/17 13:18	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/08/17 13:18	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/08/17 13:18	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/08/17 13:18	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/08/17 13:18	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/08/17 13:18	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/08/17 13:18	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/08/17 13:18	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/08/17 13:18	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/08/17 13:18	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/08/17 13:18	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/08/17 13:18	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/08/17 13:18	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/08/17 13:18	
Naphthalene	ug/L	<0.064	1.0	0.064	06/08/17 13:18	
o-Xylene	ug/L	<0.044	0.50	0.044	06/08/17 13:18	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/08/17 13:18	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/08/17 13:18	
Styrene	ug/L	<0.056	0.50	0.056	06/08/17 13:18	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/08/17 13:18	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/08/17 13:18	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/08/17 13:18	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/08/17 13:18	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/08/17 13:18	
Toluene	ug/L	<0.059	1.0	0.059	06/08/17 13:18	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/08/17 13:18	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/08/17 13:18	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/08/17 13:18	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/08/17 13:18	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/08/17 13:18	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/08/17 13:18	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/08/17 13:18	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/08/17 13:18	
1,2-Dichloroethane-d4 (S)	%	101	75-137		06/08/17 13:18	
4-Bromofluorobenzene (S)	%	101	75-125		06/08/17 13:18	
Toluene-d8 (S)	%	100	75-125		06/08/17 13:18	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

LABORATORY CONTROL SAMPLE & LCSD: 2607382		2607383								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.8	21.2	109	106	75-136	3	30	
1,1,1-Trichloroethane	ug/L	20	20.1	19.6	101	98	75-129	3	30	
1,1,2,2-Tetrachloroethane	ug/L	20	21.6	20.3	108	102	71-138	6	30	
1,1,2-Trichloroethane	ug/L	20	20.3	19.6	102	98	75-125	4	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.9	20.9	105	104	69-126	0	30	
1,1-Dichloroethane	ug/L	20	20.3	19.5	102	98	75-125	4	30	
1,1-Dichloroethene	ug/L	20	20.1	19.6	101	98	75-125	3	30	
1,1-Dichloropropene	ug/L	20	21.0	20.5	105	102	75-125	2	30	
1,2,3-Trichlorobenzene	ug/L	20	19.9	19.5	99	98	75-125	2	30	
1,2,3-Trichloropropane	ug/L	20	22.0	20.6	110	103	75-125	7	30	
1,2,4-Trichlorobenzene	ug/L	20	20.1	19.7	100	98	75-125	2	30	
1,2,4-Trimethylbenzene	ug/L	20	20.1	19.4	101	97	75-125	4	30	
1,2-Dibromo-3-chloropropane	ug/L	50	51.7	50.1	103	100	71-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	20	22.2	20.8	111	104	75-125	6	30	
1,2-Dichlorobenzene	ug/L	20	22.1	20.9	110	105	75-125	5	30	
1,2-Dichloroethane	ug/L	20	21.0	19.2	105	96	70-125	9	30	
1,2-Dichloroethene (Total)	ug/L	40	40.9	39.7	102	99	75-125	3	30	
1,2-Dichloropropane	ug/L	20	21.6	20.2	108	101	75-125	7	30	
1,3,5-Trimethylbenzene	ug/L	20	21.2	20.9	106	105	75-125	2	30	
1,3-Dichlorobenzene	ug/L	20	21.2	20.2	106	101	75-125	5	30	
1,3-Dichloropropane	ug/L	20	22.7	21.1	114	106	75-125	7	30	
1,4-Dichlorobenzene	ug/L	20	21.0	19.9	105	99	75-125	5	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	435	394	109	99	64-140	10	30	
2,2,4-Trimethylpentane	ug/L	20	20.7	19.8	104	99	68-125	4	30	
2,2-Dichloropropane	ug/L	20	20.9	20.7	105	104	70-131	1	30	
2-Butanone (MEK)	ug/L	100	106	97.3	106	97	69-125	9	30	
2-Chlorotoluene	ug/L	20	21.3	20.5	107	102	75-125	4	30	
2-Hexanone	ug/L	100	113	108	113	108	73-129	5	30	
4-Chlorotoluene	ug/L	20	21.6	20.7	108	103	75-125	4	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	111	104	111	104	73-125	6	30	
Acetone	ug/L	100	164	131	164	131	66-126	22	30	CH,L1
Acrolein	ug/L	200	231	217	115	109	56-150	6	30	
Acrylonitrile	ug/L	200	216	201	108	100	68-129	7	30	
Benzene	ug/L	20	20.0	19.4	100	97	75-125	3	30	
Bromobenzene	ug/L	20	21.3	19.9	106	100	75-125	6	30	
Bromochloromethane	ug/L	20	22.2	20.6	111	103	75-126	7	30	
Bromodichloromethane	ug/L	20	21.3	20.3	107	102	75-133	5	30	
Bromoform	ug/L	20	20.0	18.9	100	95	62-142	5	30	
Bromomethane	ug/L	20	16.2	18.2	81	91	34-143	11	30	
Carbon disulfide	ug/L	20	20.1	19.7	101	98	71-125	2	30	
Carbon tetrachloride	ug/L	20	20.9	20.4	104	102	71-145	2	30	
Chlorobenzene	ug/L	20	21.0	20.4	105	102	75-125	3	30	
Chloroethane	ug/L	20	20.9	19.7	104	99	75-125	6	30	
Chloroform	ug/L	20	20.2	19.3	101	96	75-125	5	30	
Chloromethane	ug/L	20	18.4	18.5	92	93	54-125	1	30	
cis-1,2-Dichloroethene	ug/L	20	20.7	20.1	104	101	75-125	3	30	
cis-1,3-Dichloropropene	ug/L	20	20.6	19.3	103	96	75-125	6	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

LABORATORY CONTROL SAMPLE & LCSD:		2607382		2607383							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.4	19.7	102	98	74-141	4	30		
Dibromomethane	ug/L	20	23.5	21.4	117	107	75-125	9	30		
Dichlorodifluoromethane	ug/L	20	18.8	18.4	94	92	59-130	2	30		
Dichlorofluoromethane	ug/L	20	20.1	19.9	101	99	75-125	1	30		
Diisopropyl ether	ug/L	20	21.0	19.9	105	100	69-125	5	30		
Ethyl-tert-butyl ether	ug/L	20	21.7	20.3	109	101	73-125	7	30		
Ethylbenzene	ug/L	20	20.5	20.2	102	101	75-125	1	30		
Hexachloro-1,3-butadiene	ug/L	20	21.6	21.4	108	107	75-131	1	30		
Isopropylbenzene (Cumene)	ug/L	20	21.3	21.1	106	105	75-125	1	30		
m&p-Xylene	ug/L	40	43.3	42.8	108	107	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	21.2	19.8	106	99	75-125	7	30		
Methylene Chloride	ug/L	20	20.3	19.0	102	95	73-125	7	30		
n-Butylbenzene	ug/L	20	21.5	21.5	107	108	75-125	0	30		
n-Propylbenzene	ug/L	20	20.8	20.4	104	102	75-125	2	30		
Naphthalene	ug/L	20	19.2	19.0	96	95	74-125	1	30		
o-Xylene	ug/L	20	22.2	21.2	111	106	75-125	4	30		
p-Isopropyltoluene	ug/L	20	20.2	19.9	101	100	75-125	1	30		
sec-Butylbenzene	ug/L	20	21.5	21.1	107	106	75-125	2	30		
Styrene	ug/L	20	20.4	19.5	102	98	75-125	4	30		
tert-Amylmethyl ether	ug/L	20	21.0	19.8	105	99	71-126	6	30		
tert-Butyl Alcohol	ug/L	200	215	209	107	104	69-131	3	30		
tert-Butylbenzene	ug/L	20	20.8	20.7	104	103	75-125	0	30		
Tetrachloroethene	ug/L	20	20.0	20.1	100	100	75-125	0	30		
Tetrahydrofuran	ug/L	200	345	269	173	135	65-127	25	30	CH,L1	
Toluene	ug/L	20	18.6	18.2	93	91	75-125	2	30		
trans-1,2-Dichloroethene	ug/L	20	20.2	19.6	101	98	75-125	3	30		
trans-1,3-Dichloropropene	ug/L	20	20.9	19.7	104	98	75-125	6	30		
trans-1,4-Dichloro-2-butene	ug/L	50	49.3	48.2	99	96	30-150	2	30		
Trichloroethene	ug/L	20	20.5	19.6	102	98	75-125	4	30		
Trichlorofluoromethane	ug/L	20	20.2	19.7	101	99	71-140	2	30		
Vinyl acetate	ug/L	20	20.6	19.4	103	97	68-137	6	30		
Vinyl chloride	ug/L	20	19.9	19.6	99	98	70-125	1	30		
Xylene (Total)	ug/L	60	65.5	64.0	109	107	75-125	2	30		
1,2-Dichloroethane-d4 (S)	%				97	96	75-137				
4-Bromofluorobenzene (S)	%				99	99	75-125				
Toluene-d8 (S)	%				100	100	75-125				

MATRIX SPIKE SAMPLE:		2607384							
Parameter	Units	10391273001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers		
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	22.1	110	75-137			
1,1,1-Trichloroethane	ug/L	<0.057	20	22.8	114	75-139			
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20.9	104	60-142			
1,1,2-Trichloroethane	ug/L	<0.064	20	19.8	99	75-128			
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	26.6	133	62-150			

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

MATRIX SPIKE SAMPLE: 2607384		10391273001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.055	20	21.9	110	70-129	
1,1-Dichloroethene	ug/L	<0.069	20	23.7	118	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	23.7	119	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	21.1	105	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	21.4	107	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	21.1	106	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20.9	105	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	52.0	104	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	21.2	106	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	22.2	111	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	20.3	102	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.16	40	44.8	112	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	21.7	108	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	22.8	114	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	21.5	107	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	21.5	108	67-128	
1,4-Dichlorobenzene	ug/L	<0.081	20	21.2	106	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	413	103	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	28.5	142	48-150	
2,2-Dichloropropane	ug/L	<0.096	20	23.5	117	50-150	
2-Butanone (MEK)	ug/L	<1.1	100	102	102	58-125	
2-Chlorotoluene	ug/L	<0.084	20	22.2	111	65-138	
2-Hexanone	ug/L	<0.19	100	109	109	61-134	
4-Chlorotoluene	ug/L	<0.048	20	22.4	112	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	106	106	61-130	
Acetone	ug/L	19.5J	100	172	153	51-140	CH,M0
Acrolein	ug/L	<2.1	200	277	139	48-150	
Acrylonitrile	ug/L	<0.49	200	207	103	55-134	
Benzene	ug/L	<0.042	20	21.7	109	63-132	
Bromobenzene	ug/L	<0.087	20	21.1	105	67-138	
Bromochloromethane	ug/L	<0.082	20	21.9	109	66-138	
Bromodichloromethane	ug/L	<0.068	20	21.6	108	75-137	
Bromoform	ug/L	<0.11	20	19.4	97	65-129	
Bromomethane	ug/L	<0.20	20	20.9	105	41-150	
Carbon disulfide	ug/L	<0.20	20	23.0	115	72-132	
Carbon tetrachloride	ug/L	<0.079	20	24.8	124	75-150	
Chlorobenzene	ug/L	<0.066	20	21.6	108	73-127	
Chloroethane	ug/L	<0.12	20	23.0	115	74-138	
Chloroform	ug/L	<0.21	20	21.1	105	74-125	
Chloromethane	ug/L	<0.080	20	20.8	104	58-129	
cis-1,2-Dichloroethene	ug/L	<0.12	20	22.2	111	63-135	
cis-1,3-Dichloropropene	ug/L	<0.069	20	19.8	99	66-129	
Dibromochloromethane	ug/L	<0.048	20	20.2	101	75-133	
Dibromomethane	ug/L	<0.14	20	22.3	112	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	24.5	123	72-150	
Dichlorofluoromethane	ug/L	<0.054	20	22.2	111	75-129	
Diisopropyl ether	ug/L	<0.050	20	21.1	106	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

MATRIX SPIKE SAMPLE: 2607384		10391273001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	21.5	108	63-132	
Ethylbenzene	ug/L	<0.075	20	21.7	108	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	25.6	128	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	23.3	116	70-136	
m&p-Xylene	ug/L	<0.11	40	45.4	113	64-142	
Methyl-tert-butyl ether	ug/L	<0.047	20	21.0	105	72-125	
Methylene Chloride	ug/L	<0.097	20	20.0	100	60-132	
n-Butylbenzene	ug/L	<0.16	20	24.2	121	60-150	
n-Propylbenzene	ug/L	<0.049	20	22.7	114	63-142	
Naphthalene	ug/L	<0.064	20	19.8	99	67-125	
o-Xylene	ug/L	<0.044	20	22.8	114	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	22.1	111	64-146	
sec-Butylbenzene	ug/L	<0.094	20	24.1	121	67-144	
Styrene	ug/L	<0.056	20	20.6	103	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	20.9	104	60-134	
tert-Butyl Alcohol	ug/L	<0.89	200	207	103	56-146	
tert-Butylbenzene	ug/L	<0.051	20	23.0	115	68-135	
Tetrachloroethene	ug/L	<0.13	20	22.2	111	67-148	
Tetrahydrofuran	ug/L	<1.5	200	372	186	51-141	CH,M0
Toluene	ug/L	<0.059	20	19.2	96	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	22.6	113	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20.6	103	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	48.8	98	30-150	
Trichloroethene	ug/L	<0.044	20	22.1	110	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	24.6	123	75-150	
Vinyl acetate	ug/L	<0.12	20	20.0	100	49-143	
Vinyl chloride	ug/L	<0.098	20	23.8	119	75-133	
Xylene (Total)	ug/L	<0.15	60	68.2	114	63-142	
1,2-Dichloroethane-d4 (S)	%				97	75-137	
4-Bromofluorobenzene (S)	%				100	75-125	
Toluene-d8 (S)	%				99	75-125	

SAMPLE DUPLICATE: 2607385

Parameter	Units	10391273004	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

SAMPLE DUPLICATE: 2607385

Parameter	Units	10391273004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	<0.16	<0.16		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	<1.1	<1.1		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	6.0J	6.4J		30	
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	1.0	0.89J		30	
Carbon tetrachloride	ug/L	148	153	3	30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	9.7	9.7	1	30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

SAMPLE DUPLICATE: 2607385

Parameter	Units	10391273004 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	<0.064	<0.064		30	
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	0.28J	0.28J		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	100	99	0		
Toluene-d8 (S)	%	99	98	0		

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390957

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 478598

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.  
L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390957

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10390957001	MW8S-GW-060217	EPA 8260B	478598		
10390957002	MW6S-GW-060217	EPA 8260B	478598		
10390957003	MW1S-GW-060217	EPA 8260B	478598		
10390957004	MW9S-GW-060217	EPA 8260B	478598		
10390957005	Trip Blank	EPA 8260B	478598		

### REPORT OF LABORATORY ANALYSIS

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.


10390957

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Gary Honeyman	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus		Company Name: UPRR	
Email: <u>mark.Ochsner@ch2m.com</u>		Purchase Order #:		Address: CAS	
Phone: [ ] Fax: [ ]	Project Name: UPRR_Freeman		Pace Quote:		Regulatory Agency:
Requested Due Date/Circle: 24 Hour / 5 Day / <b>10 Day</b>		Project #: 1497		Pace Project Manager:	
				Pace Profile #: 36447 / 4	
				State / Location: WA / Freeman	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analyzes Test Y/N	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Low Level VOCs by 8260	6010/7470 TAL Metals		2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethane RSK175	BOD 10360W	COD 410.4	CSIA of CTET (8260 Must be analyzed)		
				DATE	TIME	DATE	TIME																								
1	MW8S-GW-060217	WTG				6-2-17	10:15	3																						001	
2	MW8S-GW-060217						11:05	3																						002	
3	MW1S-GW-060217						11:45	3																						003	
4	MW9S-GW-060217						12:25	3																						004	
5	Trip Blank							2																						005	
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELIQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
							TEMP in C	Received on Ice: (Y/N)	Custody Sealed: (Y/N)	Cooler: (Y/N)
Short hold analyses are in bold	Steve Demus / CH2M	6-2-17	15:00	Pace	6/3/17	9:15	4.6	Y	Y	Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice: (Y/N)	Custody Sealed: (Y/N)	Cooler: (Y/N)	Samples Intact: (Y/N)
PRINT Name of SAMPLER: Steve Demus						
SIGNATURE of SAMPLER: <i>Steve Demus</i>						
		DATE Signed: 6-2-17				

<b>Sample Condition Upon Receipt - ESI Tech Specs</b>	Client Name: <b>CH2M Hill UPR</b>	Project #: <b>WO# : 10390957</b>
	Courier: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Commercial <input type="checkbox"/> Pace <input type="checkbox"/> SpeeDee <input type="checkbox"/> Other: _____ Tracking Number: <b>7222 2739 9102</b>	 <b>10390957</b>

Custody Seal on Cooler/Box Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Packing Material: <input type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Bubble Bags <input type="checkbox"/> None <input checked="" type="checkbox"/> Other: <b>PB</b> Thermometer Used: <input checked="" type="checkbox"/> 151401163 <input type="checkbox"/> 151401164 Cooler Temp Read (°C): <b>4.5</b> Temp should be above freezing to 6°C	Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None Cooler Temp Corrected (°C): <b>4.6</b> Correction Factor: <b>+0.1</b>	Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Date and Initials of Person Examining Contents: <b>Rb 6/3/17</b> Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input type="checkbox"/> No
---	---	---

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

Chain of Custody Present?	Chain of Custody Filled Out?	Chain of Custody Relinquished?	Sampler Name and/or Signature on COC?	Samples Arrived within Hold Time?	Short Hold Time Analysis (<72 hr)?	Rush Turn Around Time Requested?	Sufficient Volume (triple volume provided for MS/MSD)?	Correct Containers Used?	-Pace Containers Used?	Containers Intact?	Filtered Volume Received for Dissolved Tests?	Sample Labels Match COC?	-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>	All containers needing acid/base preservation have been checked?	All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method VOA pH is checked after analysis	Headspace in VOA Vials (>6mm)?	3 Trip Blanks Present?	Trip Blank Custody Seals Present?	Pace Trip Blank Lot # (if purchased): <b>02 042417-3CYR</b>	COMMENTS:
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. Note if sediment is visible in the dissolved container. 12. _____ 13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res Chlorine? <input checked="" type="checkbox"/> N/A Sample # <del>1-4</del> just VOA SDD 6-3-17 Initial when completed: _____    Lot # of added preservative: _____ 14. <del>AWIS 9 that has headspace</del> JMG 15. <del>RSK Has NO Headspace</del> 06/05/17 only 2 trip blanks

**CLIENT NOTIFICATION/RESOLUTION**      Field Data Required?  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>10:49</b>	Temp: <b>4.5</b>	Corrected Temp: <b>4.6</b>
Time: <b>10:57</b>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS      Date: 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 13, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

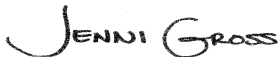
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: UST-078  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: MN00064  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8 Certification #: 8TMS-L  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Michigan Certification #: 9909

Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia WW Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842015-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC):  
E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC):  
T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390958001	Stark-GW-060117	Water	06/01/17 11:00	06/03/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390958001	Stark-GW-060117	RSK 175	DR1	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390958001</b>	<b>Stark-GW-060117</b>					
RSK 175	Methane	1.5J	ug/L	10.0	06/05/17 13:28	
6010C Met	Barium, Dissolved	36.8	ug/L	10.0	06/09/17 10:13	
6010C Met	Calcium, Dissolved	34800	ug/L	500	06/09/17 10:13	
6010C Met	Copper, Dissolved	227	ug/L	10.0	06/09/17 10:13	
6010C Met	Lead, Dissolved	2.7J	ug/L	10.0	06/09/17 10:13	
6010C Met	Magnesium, Dissolved	12200	ug/L	500	06/09/17 10:13	
6010C Met	Manganese, Dissolved	0.50J	ug/L	5.0	06/09/17 10:13	
6010C Met	Potassium, Dissolved	1730J	ug/L	2500	06/09/17 10:13	
6010C Met	Sodium, Dissolved	18100	ug/L	1000	06/09/17 10:13	
6010C Met	Thallium, Dissolved	5.0J	ug/L	20.0	06/09/17 10:13	
6010C Met	Vanadium, Dissolved	6.3J	ug/L	15.0	06/09/17 10:13	
6010C Met	Zinc, Dissolved	189	ug/L	20.0	06/09/17 10:13	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	106	mg/L	5.0	06/10/17 14:53	
SM 2540C	Total Dissolved Solids	299	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	1.4	mg/L	1.2	06/03/17 15:46	B
EPA 300.0	Nitrate as N	17.0	mg/L	0.50	06/03/17 22:42	H1,M1
EPA 300.0	Sulfate	11.1	mg/L	1.2	06/03/17 15:46	M1
SM 5310C	Total Organic Carbon	0.34J	mg/L	1.0	06/07/17 20:08	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 82137

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390958001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 349115)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

### General Information:

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- Stark-GW-060117 (Lab ID: 10390958001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 477706

B: Analyte was detected in the associated method blank.

- BLANK for HBN 477706 [WETA/312 (Lab ID: 2603221)
- Chloride

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 477706

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390958001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2603223)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2603224)
  - Nitrate as N
  - Sulfate

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 13, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

**Sample: Stark-GW-060117**      **Lab ID: 10390958001**      Collected: 06/01/17 11:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/05/17 13:28	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/05/17 13:28	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		06/05/17 13:28	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:13	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:13	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:13	7440-38-2	
Barium, Dissolved	36.8	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:13	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:13	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:13	7440-43-9	
Calcium, Dissolved	34800	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:13	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:13	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:13	7440-48-4	
Copper, Dissolved	227	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:13	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:13	7439-89-6	
Lead, Dissolved	2.7J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:13	7439-92-1	
Magnesium, Dissolved	12200	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:13	7439-95-4	
Manganese, Dissolved	0.50J	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:13	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:13	7440-02-0	
Potassium, Dissolved	1730J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:13	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:13	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:13	7440-22-4	
Sodium, Dissolved	18100	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:13	7440-23-5	
Thallium, Dissolved	5.0J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:13	7440-28-0	
Vanadium, Dissolved	6.3J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:13	7440-62-2	
Zinc, Dissolved	189	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:13	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 15:01	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	106	mg/L	5.0	1.4	1		06/10/17 14:53		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	299	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/08/17 11:51	18496-25-8	M1
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.4	mg/L	1.2	0.10	1		06/03/17 15:46	16887-00-6	B
Nitrate as N	17.0	mg/L	0.50	0.065	5		06/03/17 22:42	14797-55-8	H1,M1
Sulfate	11.1	mg/L	1.2	0.16	1		06/03/17 15:46	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

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**Sample: Stark-GW-060117**      **Lab ID: 10390958001**      Collected: 06/01/17 11:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.34J</b>	mg/L	1.0	0.20	1		06/07/17 20:08	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 477813 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10390958001

METHOD BLANK: 2603683 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/05/17 10:52	
Ethene	ug/L	<0.68	10.0	0.68	06/05/17 10:52	
Methane	ug/L	1.5J	10.0	1.1	06/05/17 10:52	

LABORATORY CONTROL SAMPLE & LCSD: 2603684

Parameter	Units	2603685				% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec						
Ethane	ug/L	114	97.7	103	86	90	85-115	5	20		
Ethene	ug/L	106	91.9	96.5	87	91	85-115	5	20		
Methane	ug/L	60.7	51.7	54.5	85	90	85-115	5	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2604162

Parameter	Units	10390958001		2604163		MS % Rec	MSD % Rec	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Ethane	ug/L	<4.9	114	114	89.2	85.4	78	75	30-150	4	20		
Ethene	ug/L	<0.68	106	106	84.8	81.0	80	76	30-150	5	20		
Methane	ug/L	1.5J	60.7	60.7	47.7	45.4	76	72	30-150	5	20		

SAMPLE DUPLICATE: 2604161

Parameter	Units	10390831004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.6J	1.6J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

QC Batch: 478518	Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A	Analysis Description: 7470A Mercury Water Dissolved
Associated Lab Samples: 10390958001	

METHOD BLANK: 2606985 Matrix: Water

Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/12/17 14:29	

LABORATORY CONTROL SAMPLE: 2606986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606987 2606988

Parameter	Units	2606987		2606988		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Mercury, Dissolved	ug/L	<0.062	5	5	4.7	4.6	95	93	80-120	2	20

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 478400 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10390958001

METHOD BLANK: 2606177 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/09/17 09:24	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/09/17 09:24	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/09/17 09:24	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/09/17 09:24	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/09/17 09:24	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/09/17 09:24	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/09/17 09:24	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/09/17 09:24	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/09/17 09:24	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/09/17 09:24	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/09/17 09:24	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/09/17 09:24	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/09/17 09:24	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/09/17 09:24	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/09/17 09:24	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/09/17 09:24	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/09/17 09:24	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/09/17 09:24	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/09/17 09:24	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/09/17 09:24	

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21000	105	80-120	
Antimony, Dissolved	ug/L	1000	1060	106	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1030	103	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19900	99	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1000	100	80-120	
Iron, Dissolved	ug/L	20000	20200	101	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	500	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606181 2606182

Parameter	Units	10390958001		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Aluminum, Dissolved	ug/L	<13.5	20000	20000	21200	21700	106	109	75-125	2	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1060	1070	106	107	75-125	1	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1040	1060	104	106	75-125	2	20	
Barium, Dissolved	ug/L	36.8	1000	1000	1070	1080	103	105	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1050	1070	105	107	75-125	2	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	1030	1050	103	105	75-125	2	20	
Calcium, Dissolved	ug/L	34800	20000	20000	54400	55000	98	101	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	1010	1040	101	103	75-125	2	20	
Cobalt, Dissolved	ug/L	<0.51	1000	1000	1000	1020	100	102	75-125	2	20	
Copper, Dissolved	ug/L	227	1000	1000	1240	1260	101	103	75-125	2	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	20200	20700	101	104	75-125	2	20	
Lead, Dissolved	ug/L	2.7J	1000	1000	1030	1050	103	105	75-125	2	20	
Magnesium, Dissolved	ug/L	12200	20000	20000	32600	33000	102	104	75-125	1	20	
Manganese, Dissolved	ug/L	0.50J	1000	1000	1030	1050	103	105	75-125	2	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	1010	1030	101	103	75-125	2	20	
Potassium, Dissolved	ug/L	1730J	20000	20000	22500	22700	104	105	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1080	1090	107	109	75-125	2	20	
Silver, Dissolved	ug/L	<0.28	500	500	508	515	102	103	75-125	1	20	
Sodium, Dissolved	ug/L	18100	20000	20000	38100	38200	100	100	75-125	0	20	
Thallium, Dissolved	ug/L	5.0J	1000	1000	1010	1040	100	103	75-125	3	20	
Vanadium, Dissolved	ug/L	6.3J	1000	1000	1010	1020	100	102	75-125	2	20	
Zinc, Dissolved	ug/L	189	1000	1000	1180	1210	100	102	75-125	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 479020 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10390958001

METHOD BLANK: 2609847 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/10/17 13:47	

LABORATORY CONTROL SAMPLE & LCSD: 2609848 2609849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	41.4	41.5	104	104	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609850 2609851

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	106	40	40	143	145	92	99	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609852 2609853

Parameter	Units	10391083002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	94.9	40	40	141	136	115	103	80-120	3	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 478006 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10390958001

METHOD BLANK: 2604393 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/06/17 15:39	

LABORATORY CONTROL SAMPLE: 2604394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	942	94	80-120	

SAMPLE DUPLICATE: 2604395

Parameter	Units	10390815003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	301	300	0	10	

SAMPLE DUPLICATE: 2604396

Parameter	Units	10390958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	299	305	2	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 82137 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10390958001

METHOD BLANK: 349112 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/08/17 11:48	

LABORATORY CONTROL SAMPLE: 349113

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	106	90-110	

MATRIX SPIKE SAMPLE: 349115

Parameter	Units	10390958001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.074	37	75-125	M1

SAMPLE DUPLICATE: 349114

Parameter	Units	10390958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 477706 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10390958001

METHOD BLANK: 2603221 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.37J	1.2	0.10	06/03/17 14:16	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/03/17 14:16	
Sulfate	mg/L	0.35J	1.2	0.16	06/03/17 14:16	

LABORATORY CONTROL SAMPLE: 2603222

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	99	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	11.8	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2603223 2603224

Parameter	Units	10390958001		2603224		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	1.4	12.5	12.5	13.1	13.0	93	93	90-110	0	20		
Nitrate as N	mg/L	17.0	5	5	20.7	20.6	73	72	90-110	0	20	M1	
Sulfate	mg/L	11.1	12.5	12.5	21.2	21.2	80	80	90-110	0	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390958

QC Batch: 115712 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10390958001

METHOD BLANK: 456457 Matrix: Water  
Associated Lab Samples: 10390958001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/07/17 14:51	

LABORATORY CONTROL SAMPLE: 456458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.6	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456459 456460

Parameter	Units	10390833004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Total Organic Carbon	mg/L	0.46J	25	25	25.5	25.8	100	101	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456461 456462

Parameter	Units	10390958001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Total Organic Carbon	mg/L	0.34J	25	25	25.4	25.8	100	102	80-120	2	20	

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390958

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10390958001	Stark-GW-060117	RSK 175	477813		
10390958001	Stark-GW-060117	EPA 3010	478400	6010C Met	478860
10390958001	Stark-GW-060117	EPA 7470A	478518	EPA 7470A	479036
10390958001	Stark-GW-060117	SM 2320B	479020		
10390958001	Stark-GW-060117	SM 2540C	478006		
10390958001	Stark-GW-060117	SM 4500-S-2 D	82137		
10390958001	Stark-GW-060117	EPA 300.0	477706		
10390958001	Stark-GW-060117	SM 5310C	115712		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10390958

**Section A**

**Section B**

**Section C**

**Required Client Information:**

**Required Project Information:**

**Invoice Information:**

Page :	Of
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Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR
Email: mark.Ochsner@ch2m.com	Purchase Order #:	Address: CAS
Phone: Fax:	Project Name: UPRR_Freeman	Pace Quote:
Requested Due Date/Circle: 24 Hour / 5 Day / <b>10 Day</b>	Project #: 1497	Pace Project Manager:
		Pace Profile #: 35447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box... (A-Z, 0-9 /, -) Sample IDs must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	PRESERVATIVES								ANALYSES TEST	REQUESTED ANALYSES FILTERED (Y/N)										Residual Chlorine (Y/N)								
				START		END			# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HClO4	NaOH + Zn Acetate	Na2S2O3	Methanol		Other	Low Level VGGs by 4266 C	60107470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	BOD 10360W		COD 410.4	CSIA of CTET (8260 Must be analyzed)						
				DATE	TIME	DATE	TIME																													
1	Stark-GW-060117	WTG	G			6-1-17	11:00	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	MS/MSD	
2																																				
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10																																				
11																																				
12																																				

RL 6/3/17

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	John Kahan	6-2-17	15:00	Gary Pace	6/3/17	9:15	Y Y Y
							3.7

<b>SAMPLER NAME AND SIGNATURE</b>		TEMP in C	Received on Ice: (Y/N)	Custody Sealed: (Y/N)	Cooler: (Y/N)	Samples Intact: (Y/N)
PRINT Name of SAMPLER:	DATE Signed:					
SIGNATURE of SAMPLER:						

**Sample Condition Upon Receipt - ESI Tech Specs** Client Name: CH2MHill Project #: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7222 2739 9098

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: FB Temp Blank?  Yes  No  
 Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.7 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 10.1 Date and Initials of Person Examining Contents: RBG/3/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <u>RBG/3/17</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (Water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # <u>313</u> <u>313</u> <u>313</u> Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>RSK Needs Head space</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>11:20</u>	Temp: <u>3.6</u>	Corrected Temp: <u>3.7</u>
Time: <u>11:44</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS Date: 06/05/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 2055660



2055660



Workorder: 10390958

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/3/2017

Results Requested By: 6/19/2017

Report To		Subcontract To					Requested Analysis																								
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers						Other	LAB USE ONLY																		
1	Stark-GW-080117	RQS	6/1/2017 11:00	10390958001	Water	3							X																		
2																															
3																															
4																															
5																															

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>[Signature]</i>	Pace MN 6/5/17 1325																
REDEX	6/6/17 9:15	J. C. Pace	6/6/17 9:15														

Cooler Temperature on Receipt 3.7 °C    Custody Seal  or N    Received on Ice  or N    Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Sample Condition Upon R

1000 Riverbend Blvd., Suite F
St. Rose, LA 70087

WO#: 2055660

PM: CMM

Due Date: 06/19/17

CLIENT: PASI-MINN

Proj

Courier: Pace Courier Hired Courier Fed X UPS DHL USPS Customer Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact: Yes No

Thermometer Used: Therm Fisher IR 5 Therm Fisher IR 6 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-07-17 MZ

Temp must be measured from Temperature blank when present

Comments:

Table with 15 rows and 3 columns: Question, Yes/No/N/A checkboxes, and Number. Includes items like 'Temperature Blank Present?', 'Chain of Custody Present', 'Chain of Custody Complete', etc.

Client Notification/ Resolution:

Person Contacted:

Date/Time:

Comments/ Resolution:



# Chain of Custody

**WO# : 1288655**  
 PM: HRZ      Due Date: 06/19/17  
 CLIENT: PACE MPLS



**Workorder:** 10390958      **Workorder Name:** 1497 UPRR\_Freeman      **Owner Received Date:** 6/3/2017      **Results Requested By:** 6/19/2017

Report To		Subcontract To				Requested Analysis																									
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				<div style="display: flex; justify-content: space-between;"> <span>5632354 / 5310 TOC</span> </div>																									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													H2SO4	Preserved Containers					LAB USE ONLY							
1	Stark-GW-060117	RQS	6/1/2017 11:00	10390958001	Water													9													
2																															
3																															
4																															


Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1		6/5/17 1325		6/5/17 1730	
2		6/5/17 2(3)		6/10/17 0800	
3					

**Cooler Temperature on Receipt** 1.4 °C      **Custody Seal**  or N      **Received on Ice**  or N      **Samples Intact**  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MV

Project #: **WO# 1288655**  


Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Loz Pac      Temp Blank?  Yes  No

Thermometer Used:  140792808      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.1      Cooler Temp Corrected °C: 1.4      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: +0.3      Date and Initials of Person Examining Contents: JPC 6/15/17

Comments: NET to let 17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>CGT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE    Y    N

TEMPERATURE WAIVER ON FILE    Y    N

Project Manager Review: [Signature]      Date: 6.6.17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 16, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

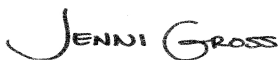
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390959001	Silva-GW-060117	Water	06/01/17 10:00	06/03/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390959001	Silva-GW-060117	RSK 175	DR1	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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## SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390959001</b>	<b>Silva-GW-060117</b>					
RSK 175	Methane	1.6J	ug/L	10.0	06/05/17 13:50	
6010C Met	Calcium, Dissolved	51.4J	ug/L	500	06/09/17 10:34	
6010C Met	Copper, Dissolved	93.6	ug/L	10.0	06/09/17 10:34	
6010C Met	Lead, Dissolved	5.6J	ug/L	10.0	06/09/17 10:34	
6010C Met	Magnesium, Dissolved	214J	ug/L	500	06/09/17 10:34	
6010C Met	Manganese, Dissolved	1.2J	ug/L	5.0	06/09/17 10:34	
6010C Met	Sodium, Dissolved	83600	ug/L	1000	06/09/17 10:34	
6010C Met	Vanadium, Dissolved	1.0J	ug/L	15.0	06/09/17 10:34	
6010C Met	Zinc, Dissolved	114	ug/L	20.0	06/09/17 10:34	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	152	mg/L	5.0	06/10/17 15:07	
SM 2540C	Total Dissolved Solids	263	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	19.3	mg/L	1.2	06/03/17 16:49	
EPA 300.0	Nitrate as N	0.23	mg/L	0.10	06/03/17 16:49	H1
EPA 300.0	Sulfate	5.6	mg/L	1.2	06/03/17 16:49	
SM 5310C	Total Organic Carbon	0.43J	mg/L	1.0	06/07/17 21:01	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

### General Information:

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- Silva-GW-060117 (Lab ID: 10390959001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 477706

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390958001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2603223)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2603224)
  - Nitrate as N
  - Sulfate

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

---

**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479521

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390953015, 10390953016

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2611895)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2611896)
  - Chemical Oxygen Demand

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

**Sample: Silva-GW-060117**      **Lab ID: 10390959001**      Collected: 06/01/17 10:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/05/17 13:50	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/05/17 13:50	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		06/05/17 13:50	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:34	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:34	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:34	7440-38-2	
Barium, Dissolved	<0.20	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:34	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:34	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:34	7440-43-9	
Calcium, Dissolved	51.4J	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:34	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:34	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:34	7440-48-4	
Copper, Dissolved	93.6	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:34	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:34	7439-89-6	
Lead, Dissolved	5.6J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:34	7439-92-1	
Magnesium, Dissolved	214J	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:34	7439-95-4	
Manganese, Dissolved	1.2J	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:34	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:34	7440-02-0	
Potassium, Dissolved	<26.1	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:34	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:34	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:34	7440-22-4	
Sodium, Dissolved	83600	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:34	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:34	7440-28-0	
Vanadium, Dissolved	1.0J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:34	7440-62-2	
Zinc, Dissolved	114	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:34	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 15:08	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	152	mg/L	5.0	1.4	1		06/10/17 15:07		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	263	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	19.3	mg/L	1.2	0.10	1		06/03/17 16:49	16887-00-6	
Nitrate as N	0.23	mg/L	0.10	0.013	1		06/03/17 16:49	14797-55-8	H1
Sulfate	5.6	mg/L	1.2	0.16	1		06/03/17 16:49	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

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**Sample: Silva-GW-060117**      **Lab ID: 10390959001**      Collected: 06/01/17 10:00      Received: 06/03/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>410.4 COD</b>									
Analytical Method: EPA 410.4    Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 12:04	06/15/17 08:37		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.43J</b>	mg/L	1.0	0.20	1		06/07/17 21:01	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 477813 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10390959001

METHOD BLANK: 2603683 Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/05/17 10:52	
Ethene	ug/L	<0.68	10.0	0.68	06/05/17 10:52	
Methane	ug/L	1.5J	10.0	1.1	06/05/17 10:52	

LABORATORY CONTROL SAMPLE & LCSD: 2603684

Parameter	Units	2603685								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	97.7	103	86	90	85-115	5	20	
Ethene	ug/L	106	91.9	96.5	87	91	85-115	5	20	
Methane	ug/L	60.7	51.7	54.5	85	90	85-115	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2604162 2604163

Parameter	Units	10390958001 Result	2604163								Qual	
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD		Max RPD
Ethane	ug/L	<4.9	114	114	89.2	85.4	78	75	30-150	4	20	
Ethene	ug/L	<0.68	106	106	84.8	81.0	80	76	30-150	5	20	
Methane	ug/L	1.5J	60.7	60.7	47.7	45.4	76	72	30-150	5	20	

SAMPLE DUPLICATE: 2604161

Parameter	Units	10390831004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.6J	1.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 478518      Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A      Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10390959001

METHOD BLANK: 2606985      Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/12/17 14:29	

LABORATORY CONTROL SAMPLE: 2606986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606987      2606988

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.7	4.6	95	93	80-120	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 478400 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10390959001

METHOD BLANK: 2606177 Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/09/17 09:24	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/09/17 09:24	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/09/17 09:24	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/09/17 09:24	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/09/17 09:24	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/09/17 09:24	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/09/17 09:24	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/09/17 09:24	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/09/17 09:24	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/09/17 09:24	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/09/17 09:24	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/09/17 09:24	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/09/17 09:24	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/09/17 09:24	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/09/17 09:24	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/09/17 09:24	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/09/17 09:24	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/09/17 09:24	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/09/17 09:24	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/09/17 09:24	

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21000	105	80-120	
Antimony, Dissolved	ug/L	1000	1060	106	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1030	103	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19900	99	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1000	100	80-120	
Iron, Dissolved	ug/L	20000	20200	101	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	500	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606181 2606182

Parameter	Units	10390958001		2606181		2606182		% Rec	% Rec	% Rec Limits	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Result	MS % Rec	MSD % Rec					
Aluminum, Dissolved	ug/L	<13.5	20000	20000	21200	21700	106	109	75-125	2	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1060	1070	106	107	75-125	1	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1040	1060	104	106	75-125	2	20	
Barium, Dissolved	ug/L	36.8	1000	1000	1070	1080	103	105	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1050	1070	105	107	75-125	2	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	1030	1050	103	105	75-125	2	20	
Calcium, Dissolved	ug/L	34800	20000	20000	54400	55000	98	101	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	1010	1040	101	103	75-125	2	20	
Cobalt, Dissolved	ug/L	<0.51	1000	1000	1000	1020	100	102	75-125	2	20	
Copper, Dissolved	ug/L	227	1000	1000	1240	1260	101	103	75-125	2	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	20200	20700	101	104	75-125	2	20	
Lead, Dissolved	ug/L	2.7J	1000	1000	1030	1050	103	105	75-125	2	20	
Magnesium, Dissolved	ug/L	12200	20000	20000	32600	33000	102	104	75-125	1	20	
Manganese, Dissolved	ug/L	0.50J	1000	1000	1030	1050	103	105	75-125	2	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	1010	1030	101	103	75-125	2	20	
Potassium, Dissolved	ug/L	1730J	20000	20000	22500	22700	104	105	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1080	1090	107	109	75-125	2	20	
Silver, Dissolved	ug/L	<0.28	500	500	508	515	102	103	75-125	1	20	
Sodium, Dissolved	ug/L	18100	20000	20000	38100	38200	100	100	75-125	0	20	
Thallium, Dissolved	ug/L	5.0J	1000	1000	1010	1040	100	103	75-125	3	20	
Vanadium, Dissolved	ug/L	6.3J	1000	1000	1010	1020	100	102	75-125	2	20	
Zinc, Dissolved	ug/L	189	1000	1000	1180	1210	100	102	75-125	2	20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

QC Batch: 479020 Analysis Method: SM 2320B  
 QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
 Associated Lab Samples: 10390959001

METHOD BLANK: 2609847 Matrix: Water  
 Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/10/17 13:47	

LABORATORY CONTROL SAMPLE & LCSD: 2609848 2609849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.4	41.5	104	104	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609850 2609851

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	106	40	40	143	145	92	99	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609852 2609853

Parameter	Units	10391083002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	94.9	40	40	141	136	115	103	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 478006 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10390959001

METHOD BLANK: 2604393 Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/06/17 15:39	

LABORATORY CONTROL SAMPLE: 2604394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	942	94	80-120	

SAMPLE DUPLICATE: 2604395

Parameter	Units	10390815003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	301	300	0	10	

SAMPLE DUPLICATE: 2604396

Parameter	Units	10390958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	299	305	2	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 82033 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10390959001

METHOD BLANK: 348613 Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/07/17 09:32	

LABORATORY CONTROL SAMPLE: 348614

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 348616

Parameter	Units	10390833004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	102	75-125	

SAMPLE DUPLICATE: 348615

Parameter	Units	10390833004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

QC Batch: 477706

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10390959001

METHOD BLANK: 2603221

Matrix: Water

Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.37J	1.2	0.10	06/03/17 14:16	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/03/17 14:16	
Sulfate	mg/L	0.35J	1.2	0.16	06/03/17 14:16	

LABORATORY CONTROL SAMPLE: 2603222

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	99	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	11.8	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2603223 2603224

Parameter	Units	10390958001		2603224		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	1.4	12.5	12.5	13.1	13.0	93	93	90-110	0	20		
Nitrate as N	mg/L	17.0	5	5	20.7	20.6	73	72	90-110	0	20	M1	
Sulfate	mg/L	11.1	12.5	12.5	21.2	21.2	80	80	90-110	0	20	M1	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 479521 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10390959001

METHOD BLANK: 2611893 Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/15/17 08:33	

LABORATORY CONTROL SAMPLE: 2611894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	302	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611895 2611896

Parameter	Units	10390953015		2611895		2611896		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec				
Chemical Oxygen Demand	mg/L	85800	25000	25000	107000	105000	84	78	90-110	1	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611897 2611898

Parameter	Units	10390953016		2611897		2611898		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec				
Chemical Oxygen Demand	mg/L	214000	250000	250000	463000	455000	99	96	90-110	2	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

QC Batch: 115712 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10390959001

METHOD BLANK: 456457 Matrix: Water  
Associated Lab Samples: 10390959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/07/17 14:51	

LABORATORY CONTROL SAMPLE: 456458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.6	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456459 456460

Parameter	Units	10390833004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Total Organic Carbon	mg/L	0.46J	25	25	25.5	25.8	100	101	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456461 456462

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Total Organic Carbon	mg/L	0.34J	25	25	25.4	25.8	100	102	80-120	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390959

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390959

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10390959001	Silva-GW-060117	RSK 175	477813		
10390959001	Silva-GW-060117	EPA 3010	478400	6010C Met	478860
10390959001	Silva-GW-060117	EPA 7470A	478518	EPA 7470A	479036
10390959001	Silva-GW-060117	SM 2320B	479020		
10390959001	Silva-GW-060117	SM 2540C	478006		
10390959001	Silva-GW-060117	SM 4500-S-2 D	82033		
10390959001	Silva-GW-060117	EPA 300.0	477706		
10390959001	Silva-GW-060117	EPA 410.4	479521	EPA 410.4	479700
10390959001	Silva-GW-060117	SM 5310C	115712		

### REPORT OF LABORATORY ANALYSIS

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Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Page : 9 of 1
Company: CH2M Hill	Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Report To: Mark Ochsner, Brad Ostapkowicz	Copy To: Steve Demus	Attention: Gary Honeyman	Company Name: UPRR	Regulatory Agency
Email: mark.Ochsner@ch2n.com	Phone: Fax	Purchase Order #:	Project Name: UPRR_Freeman	Pace Quote:	Pace Project Manager:	State / Location WA / Freeman
Requested Due Date/Cycle: 24 Hour / 5 Day / <b>10 Day</b>		Project #:	1497	Pace Profile #: 36447 / 4		

ITEM #	SAMPLE ID One Character per box (A-Z, 0-9, -)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives									Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)								
				START DATE	START TIME			END DATE	END TIME	Unpreserved	H2SO4	HNO3	HCl/FS	NaOH + Zn Acetate	NazS2O3	Methanol				Other							
1	Silva-GW-060117		WT G		6-17	10:00	10	XX	XX	XX	X														10390958		001
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	J.R. KHAM	6-17	15:00	Gary Face	6/3/17	9:15	3.7 Y Y Y

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	DATE Signed:
SIGNATURE of SAMPLER:	

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2MHill

**Project #:** WO# : 10390959



**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

**Tracking Number:** 7222 2739 9098

**Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No

**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: FB

**Thermometer Used:**  151401163  151401164 **Type of Ice:**  Wet  Blue  None

**Cooler Temp Read (°C):** 3.6 **Cooler Temp Corrected (°C):** 3.7 **Biological Tissue Frozen?**  Yes  No  N/A

**Temp should be above freezing to 6°C** **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** R66/3/17

**USDA Regulated Soil** ( N/A, water sample) **Did samples originate in a quarantine zone within the United States:** AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No **Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?**  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <u>R66/3/17</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res Chlorine? <input checked="" type="checkbox"/> Y
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>RSK Needs Head space</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>109137</u>	

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?**  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>11:20</u>	Temp: <u>3.6</u>	Corrected Temp: <u>3.7</u>
Time: <u>11:44</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS **Date:** 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Chain of Custody

WO#: 2055628



Workorder: 10390959

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/3/2017

Results Requested By: 6/19/2017

Report To		Subcontract To					Requested Analysis																			
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other	Preserved Containers				LAB USE ONLY															
1	Silva-GW-060117	PS	6/1/2017 10:00	10390959001	Water	1					X															
2																										
3																										
4																										
5																										
Comments																										
Transfers	Released By	Date/Time	Received By	Date/Time																						
1	<i>[Signature]</i> Pace MN	6/5/17 1325																								
2	FedEx	6/12/17 915	<i>[Signature]</i> PACE	6/12/17 915																						
3																										
Cooler Temperature on Receipt		3-7 °C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact								Y or N									

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

# WO#: 2055628

PM: ADC

Due Date: 06/20/17

CLIENT: PASI-MINN

Project: \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-06-17 AB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

**WO# : 1288652**  
 PM HRZ Due Date: 06/19/17  
 CLIENT: PACE MPLS

**Pace Analytical**  
 www.pacelabs.com  
 Page 1 of 34

Workorder: 10390959

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/3/2017

Results Requested By: 6/19/2017

Report To		Subcontract To					Requested Analysis																																															
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; justify-content: space-between;"> <span style="writing-mode: vertical-rl; transform: rotate(180deg);">5632354 / 5310 TOC</span> <table border="1" style="width: 100%; height: 100%;"> <tr> <th colspan="12">Preserved Containers</th> </tr> <tr> <th>H2SO4</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </div>												Preserved Containers												H2SO4																							
Preserved Containers																																																						
H2SO4																																																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix														LAB USE ONLY																																			
1	Silva-GW-060117	PS	6/1/2017 10:00	10390959001	Water	3																																																
2																																																						
3																																																						
4																																																						
5																																																						
Transfers					Released By		Date/Time	Received By		Date/Time	Comments																																											
1					<i>[Signature]</i>		Pace MN 6/5/17 1330	<i>[Signature]</i>		6/5/17 1330																																												
2					<i>[Signature]</i>		6/5/17 2135	<i>[Signature]</i>		6/5/17 2050																																												
3																																																						
Cooler Temperature on Receipt			1.4 °C		Custody Seal			Y or N		Received on Ice			Y or N			Samples Intact						Y or N																																

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.


**Sample Condition Upon Receipt**

Client Name:

*Pace MIV*

Project #:

**WO#: 1288652**



1288652

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: *Hot Pad*      Temp Blank?  Yes  No

Thermometer Used:  140792808      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: *1.1*      Cooler Temp Corrected °C: *1.4*      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: *+0.3*      Date and Initials of Person Examining Contents: *JPC 6/15/17*

Comments: *MT 6-6-17*

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <i>MT</i>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:

*[Signature]*

Date: *6.6.17*

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 16, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

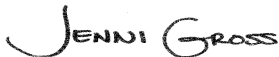
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414	Minnesota Certification #: 027-053-137
A2LA Certification #: 2926.01	Mississippi Certification #: MN00064
Alabama Certification #: 40770	Montana Certification #: CERT0092
Alaska Contaminated Sites Certification #: UST-078	Nebraska Certification #: NE-OS-18-06
Alaska DW Certification #: MN00064	Nevada Certification #: MN00064
Arizona Certification #: AZ0014	New Hampshire Certification #: 2081
Arkansas Certification #: 88-0680	New Jersey Certification #: MN002
California Certification #: MN00064	New York Certification #: 11647
CNMI Saipan Certification #:MP0003	North Carolina DW Certification #: 27700
Colorado Certification #: MN00064	North Carolina WW Certification #: 530
Connecticut Certification #: PH-0256	North Dakota Certification #: R-036
EPA Region 8 Certification #: 8TMS-L	Ohio DW Certification #: 41244
Florida Certification #: E87605	Ohio VAP Certification #: CL101
Georgia Certification #: 959	Oklahoma Certification #: 9507
Guam EPA Certification #: MN00064	Oregon NwTPH Certification #: MN300001
Hawaii Certification #: MN00064	Oregon Secondary Certification #: MN200001
Idaho Certification #: MN00064	Pennsylvania Certification #: 68-00563
Illinois Certification #: 200011	Puerto Rico Certification #: MN00064
Indiana Certification #: C-MN-01	South Carolina Certification #:74003001
Iowa Certification #: 368	Tennessee Certification #: TN02818
Kansas Certification #: E-10167	Texas Certification #: T104704192
Kentucky DW Certification #: 90062	Utah Certification #: MN00064
Kentucky WW Certification #: 90062	Virginia Certification #: 460163
Louisiana DEQ Certification #: 03086	Washington Certification #: C486
Louisiana DW Certification #: MN00064	West Virginia DW Certification #: 9952 C
Maine Certification #: MN00064	West Virginia WW Certification #: 382
Maryland Certification #: 322	Wisconsin Certification #: 999407970
Michigan Certification #: 9909	Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792	Minnesota Dept of Health Certification #: 027-137-445
Montana Certificate #CERT0103	North Dakota Certification: # R-203
California Certification #2973	Wisconsin DNR Certification # : 998027470
California Certification #2973	WA Department of Ecology Lab ID# C1007
Alaska Certification UST-107	Nevada DNR #MN010842015-1
Alaska Certification UST-107	Oklahoma Department of Environmental Quality
Alaska Certification #MN01084	California Certification #2973
Arizona Department of Health Certification #AZ0785	

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA	Pennsylvania Dept. of Env Protection (NELAC): 68-04202
Florida Department of Health (NELAC): E87595	Texas Commission on Env. Quality (NELAC): T104704405-09-TX
Illinois Environmental Protection Agency: 0025721	U.S. Dept. of Agriculture Foreign Soil Import: P330-10- 00119
Kansas Department of Health and Environment (NELAC): E-10266	Commonwealth of Virginia (TNI): 480246
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006	

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390960001	FD02-GW-060117	Water	06/01/17 08:00	06/03/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390960001	FD02-GW-060117	RSK 175	DR1	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390960001</b>	<b>FD02-GW-060117</b>					
RSK 175	Methane	1.5J	ug/L	10.0	06/05/17 13:57	
6010C Met	Barium, Dissolved	37.5	ug/L	10.0	06/09/17 10:37	
6010C Met	Calcium, Dissolved	35400	ug/L	500	06/09/17 10:37	
6010C Met	Copper, Dissolved	317	ug/L	10.0	06/09/17 10:37	
6010C Met	Lead, Dissolved	2.8J	ug/L	10.0	06/09/17 10:37	
6010C Met	Magnesium, Dissolved	12400	ug/L	500	06/09/17 10:37	
6010C Met	Manganese, Dissolved	0.57J	ug/L	5.0	06/09/17 10:37	
6010C Met	Potassium, Dissolved	1770J	ug/L	2500	06/09/17 10:37	
6010C Met	Sodium, Dissolved	18400	ug/L	1000	06/09/17 10:37	
6010C Met	Thallium, Dissolved	4.7J	ug/L	20.0	06/09/17 10:37	
6010C Met	Vanadium, Dissolved	6.5J	ug/L	15.0	06/09/17 10:37	
6010C Met	Zinc, Dissolved	206	ug/L	20.0	06/09/17 10:37	
SM 2320B	Alkalinity, Total as CaCO3	104	mg/L	5.0	06/10/17 15:11	
SM 2540C	Total Dissolved Solids	306	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	1.4	mg/L	1.2	06/03/17 17:34	B
EPA 300.0	Nitrate as N	17.1	mg/L	0.50	06/04/17 00:15	H3
EPA 300.0	Sulfate	11.1	mg/L	1.2	06/03/17 17:34	
SM 5310C	Total Organic Carbon	0.32J	mg/L	1.0	06/07/17 20:48	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

### General Information:

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

- H3: Sample was received or analysis requested beyond the recognized method holding time.
- FD02-GW-060117 (Lab ID: 10390960001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 477706

- B: Analyte was detected in the associated method blank.
- BLANK for HBN 477706 [WETA/312 (Lab ID: 2603221)
  - Chloride

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 477706

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390958001

- M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 2603223)
    - Nitrate as N
    - Sulfate
  - MSD (Lab ID: 2603224)
    - Nitrate as N
    - Sulfate

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479521

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390953015, 10390953016

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2611895)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2611896)
  - Chemical Oxygen Demand

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

**Sample:** FD02-GW-060117      **Lab ID:** 10390960001      Collected: 06/01/17 08:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/05/17 13:57	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/05/17 13:57	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		06/05/17 13:57	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 10:37	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:37	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 10:37	7440-38-2	
Barium, Dissolved	37.5	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 10:37	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 10:37	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 10:37	7440-43-9	
Calcium, Dissolved	35400	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 10:37	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 10:37	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 10:37	7440-48-4	
Copper, Dissolved	317	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 10:37	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 10:37	7439-89-6	
Lead, Dissolved	2.8J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 10:37	7439-92-1	
Magnesium, Dissolved	12400	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 10:37	7439-95-4	
Manganese, Dissolved	0.57J	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 10:37	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 10:37	7440-02-0	
Potassium, Dissolved	1770J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 10:37	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 10:37	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 10:37	7440-22-4	
Sodium, Dissolved	18400	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 10:37	7440-23-5	
Thallium, Dissolved	4.7J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 10:37	7440-28-0	
Vanadium, Dissolved	6.5J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 10:37	7440-62-2	
Zinc, Dissolved	206	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 10:37	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 15:10	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	104	mg/L	5.0	1.4	1		06/10/17 15:11		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	306	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.4	mg/L	1.2	0.10	1		06/03/17 17:34	16887-00-6	B
Nitrate as N	17.1	mg/L	0.50	0.065	5		06/04/17 00:15	14797-55-8	H3
Sulfate	11.1	mg/L	1.2	0.16	1		06/03/17 17:34	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

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**Sample: FD02-GW-060117**      **Lab ID: 10390960001**      Collected: 06/01/17 08:00      Received: 06/03/17 09:15      Matrix: Water

---

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>410.4 COD</b>									
Analytical Method: EPA 410.4    Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 12:04	06/15/17 08:37		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.32J</b>	mg/L	1.0	0.20	1		06/07/17 20:48	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

QC Batch:	477813	Analysis Method:	RSK 175
QC Batch Method:	RSK 175	Analysis Description:	RSK 175 AIR HEADSPACE
Associated Lab Samples:	10390960001		

METHOD BLANK: 2603683 Matrix: Water  
Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/05/17 10:52	
Ethene	ug/L	<0.68	10.0	0.68	06/05/17 10:52	
Methane	ug/L	1.5J	10.0	1.1	06/05/17 10:52	

LABORATORY CONTROL SAMPLE & LCSD: 2603684 2603685

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	97.7	103	86	90	85-115	5	20	
Ethene	ug/L	106	91.9	96.5	87	91	85-115	5	20	
Methane	ug/L	60.7	51.7	54.5	85	90	85-115	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2604162 2604163

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	89.2	85.4	78	75	30-150	4	20	
Ethene	ug/L	<0.68	106	106	84.8	81.0	80	76	30-150	5	20	
Methane	ug/L	1.5J	60.7	60.7	47.7	45.4	76	72	30-150	5	20	

SAMPLE DUPLICATE: 2604161

Parameter	Units	10390831004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.6J	1.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

QC Batch: 478518

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10390960001

METHOD BLANK: 2606985

Matrix: Water

Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/12/17 14:29	

LABORATORY CONTROL SAMPLE: 2606986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606987 2606988

Parameter	Units	2606987		2606988		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury, Dissolved	ug/L	<0.062	5	5	4.7	4.6	95	93	80-120	2	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

QC Batch: 478400 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10390960001

METHOD BLANK: 2606177 Matrix: Water  
Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/09/17 09:24	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/09/17 09:24	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/09/17 09:24	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/09/17 09:24	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/09/17 09:24	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/09/17 09:24	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/09/17 09:24	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/09/17 09:24	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/09/17 09:24	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/09/17 09:24	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/09/17 09:24	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/09/17 09:24	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/09/17 09:24	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/09/17 09:24	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/09/17 09:24	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/09/17 09:24	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/09/17 09:24	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/09/17 09:24	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/09/17 09:24	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/09/17 09:24	

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21000	105	80-120	
Antimony, Dissolved	ug/L	1000	1060	106	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1030	103	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19900	99	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1000	100	80-120	
Iron, Dissolved	ug/L	20000	20200	101	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	500	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606181 2606182

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10390958001 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	<13.5	20000	20000	21200	21700	106	109	75-125	2	20
Antimony, Dissolved	ug/L	<2.5	1000	1000	1060	1070	106	107	75-125	1	20
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1040	1060	104	106	75-125	2	20
Barium, Dissolved	ug/L	36.8	1000	1000	1070	1080	103	105	75-125	1	20
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1050	1070	105	107	75-125	2	20
Cadmium, Dissolved	ug/L	<0.30	1000	1000	1030	1050	103	105	75-125	2	20
Calcium, Dissolved	ug/L	34800	20000	20000	54400	55000	98	101	75-125	1	20
Chromium, Dissolved	ug/L	<2.0	1000	1000	1010	1040	101	103	75-125	2	20
Cobalt, Dissolved	ug/L	<0.51	1000	1000	1000	1020	100	102	75-125	2	20
Copper, Dissolved	ug/L	227	1000	1000	1240	1260	101	103	75-125	2	20
Iron, Dissolved	ug/L	<18.0	20000	20000	20200	20700	101	104	75-125	2	20
Lead, Dissolved	ug/L	2.7J	1000	1000	1030	1050	103	105	75-125	2	20
Magnesium, Dissolved	ug/L	12200	20000	20000	32600	33000	102	104	75-125	1	20
Manganese, Dissolved	ug/L	0.50J	1000	1000	1030	1050	103	105	75-125	2	20
Nickel, Dissolved	ug/L	<1.6	1000	1000	1010	1030	101	103	75-125	2	20
Potassium, Dissolved	ug/L	1730J	20000	20000	22500	22700	104	105	75-125	1	20
Selenium, Dissolved	ug/L	<4.5	1000	1000	1080	1090	107	109	75-125	2	20
Silver, Dissolved	ug/L	<0.28	500	500	508	515	102	103	75-125	1	20
Sodium, Dissolved	ug/L	18100	20000	20000	38100	38200	100	100	75-125	0	20
Thallium, Dissolved	ug/L	5.0J	1000	1000	1010	1040	100	103	75-125	3	20
Vanadium, Dissolved	ug/L	6.3J	1000	1000	1010	1020	100	102	75-125	2	20
Zinc, Dissolved	ug/L	189	1000	1000	1180	1210	100	102	75-125	2	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

QC Batch: 479020 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10390960001

METHOD BLANK: 2609847 Matrix: Water  
Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/10/17 13:47	

LABORATORY CONTROL SAMPLE & LCSD: 2609848 2609849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.4	41.5	104	104	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609850 2609851

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	106	40	40	143	145	92	99	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609852 2609853

Parameter	Units	10391083002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	94.9	40	40	141	136	115	103	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

QC Batch:	478006	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	10390960001		

METHOD BLANK: 2604393 Matrix: Water

Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/06/17 15:39	

LABORATORY CONTROL SAMPLE: 2604394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	942	94	80-120	

SAMPLE DUPLICATE: 2604395

Parameter	Units	10390815003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	301	300	0	10	

SAMPLE DUPLICATE: 2604396

Parameter	Units	10390958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	299	305	2	10	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

QC Batch: 82033 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10390960001

METHOD BLANK: 348613 Matrix: Water

Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/07/17 09:32	

LABORATORY CONTROL SAMPLE: 348614

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 348616

Parameter	Units	10390833004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	102	75-125	

SAMPLE DUPLICATE: 348615

Parameter	Units	10390833004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

QC Batch: 477706 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10390960001

METHOD BLANK: 2603221 Matrix: Water  
Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.37J	1.2	0.10	06/03/17 14:16	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/03/17 14:16	
Sulfate	mg/L	0.35J	1.2	0.16	06/03/17 14:16	

LABORATORY CONTROL SAMPLE: 2603222

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.3	99	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	11.8	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2603223 2603224

Parameter	Units	10390958001		2603224		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	1.4	12.5	12.5	13.1	13.0	93	93	90-110	0	20		
Nitrate as N	mg/L	17.0	5	5	20.7	20.6	73	72	90-110	0	20	M1	
Sulfate	mg/L	11.1	12.5	12.5	21.2	21.2	80	80	90-110	0	20	M1	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

QC Batch: 479521 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10390960001

METHOD BLANK: 2611893 Matrix: Water  
Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/15/17 08:33	

LABORATORY CONTROL SAMPLE: 2611894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	302	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611895 2611896

Parameter	Units	10390953015		2611895		2611896		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chemical Oxygen Demand	mg/L	85800	25000	25000	107000	105000	84	78	90-110	1	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611897 2611898

Parameter	Units	10390953016		2611897		2611898		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chemical Oxygen Demand	mg/L	214000	250000	250000	463000	455000	99	96	90-110	2	20

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

QC Batch: 115712 Analysis Method: SM 5310C  
 QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
 Associated Lab Samples: 10390960001

METHOD BLANK: 456457 Matrix: Water  
 Associated Lab Samples: 10390960001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/07/17 14:51	

LABORATORY CONTROL SAMPLE: 456458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.6	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456459 456460

Parameter	Units	10390833004 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Total Organic Carbon	mg/L	0.46J	25	25	25.5	25.8	100	101	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456461 456462

Parameter	Units	10390958001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Total Organic Carbon	mg/L	0.34J	25	25	25.4	25.8	100	102	80-120	2	20	

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390960

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390960

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10390960001	FD02-GW-060117	RSK 175	477813		
10390960001	FD02-GW-060117	EPA 3010	478400	6010C Met	478860
10390960001	FD02-GW-060117	EPA 7470A	478518	EPA 7470A	479036
10390960001	FD02-GW-060117	SM 2320B	479020		
10390960001	FD02-GW-060117	SM 2540C	478006		
10390960001	FD02-GW-060117	SM 4500-S-2 D	82033		
10390960001	FD02-GW-060117	EPA 300.0	477706		
10390960001	FD02-GW-060117	EPA 410.4	479521	EPA 410.4	479700
10390960001	FD02-GW-060117	SM 5310C	115712		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.


10390960

<b>Section A</b>	<b>Section B</b>	<b>Section C</b>	Page : _____ Of _____
<b>Required Client Information:</b>	<b>Required Project Information:</b>	<b>Invoice Information:</b>	
Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR	
Email: mark.Ochsner@ch2n.com	Purchase Order #:	Address: CAS	Regulatory Agency
Phone: _____ Fax: _____	Project Name: UPRR_Freeman	Pace Quote:	State / Location:
Requested Due Date/Circle: 24 Hour / 5 Day / <u>10 Day</u>	Project #: 1497	Pace Project Manager:	WA / Freeman
		Pace Profile #: 36447 / 4	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								ANALYSES TEST	Requested Analysis Filtered (Y/N)												
				START		END				Unpreserved	H2SO4	HNO3	HClAD	NaOH + Zn Acetate	Na2S2O3	Methanol	Other		Y	Low Level VOCs by 8260	6010/7470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	BOD 10360W	COD 410.4	CSIA of C1ET (8260 Must be analyzed)	Residual Chlorine (Y/N)
				DATE	TIME	DATE	TIME																								
1	FD02-GW-060117	WTG		6-17	08:00			10	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X	X		
2																															
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	<i>[Signature]</i>	6-17	15:00	<i>[Signature]</i>	6/3/17	9:15	3.7 Y Y Y

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	DATE Signed:
SIGNATURE of SAMPLER:	

<b>Sample Condition Upon Receipt - ESI Tech Specs</b>	Client Name: <b>CH2MHill</b>	Project #:	<b>WO# : 10390960</b>  10390960
	Courier: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Commercial <input type="checkbox"/> Pace <input type="checkbox"/> Speedee <input type="checkbox"/> Other:	Tracking Number: <b>7222 2739 9098</b>	

Custody Seal on Cooler/Box Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Packing Material: <input type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Bubble Bags <input type="checkbox"/> None <input checked="" type="checkbox"/> Other: <b>FB</b> Thermometer Used: <input checked="" type="checkbox"/> 151401163 <input type="checkbox"/> 151401164 Cooler Temp Read (°C): <b>3.6</b> Temp should be above freezing to 6°C	Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None Cooler Temp Corrected (°C): <b>3.7</b> Correction Factor: <b>1.1</b>	Optional: Proj. Due Date: _____ Proj. Name: _____ Temp Blank? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA Date and Initials of Person Examining Contents: <b>RLG/3/17</b>
USDA Regulated Soil ( <input checked="" type="checkbox"/> N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? <input type="checkbox"/> Yes <input type="checkbox"/> No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.</b>		

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4. <b>RLG/3/17</b>
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (Water) and Dioxin. Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <b>1 1/1 1/1 1/1</b>
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <b>RSK Needs Head space</b>
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>11:20</b>	Temp: <b>3.6</b>	Corrected Temp: <b>3.7</b>
Time: <b>11:44</b>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** ENNI GROSS Date: 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 2055652



2055652



Workorder: 10390960

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/3/2017

Results Requested By: 6/19/2017

Report To			Subcontract To					Requested Analysis																		
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426			Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Other											LAB USE ONLY				
1	FD02-GW-060117	PS	6/1/2017 08.00	10390960001	Water	1																				
2																										
3																										
4																										
5																										

						Comments
Transfers	Released By		Date/Time	Received By	Date/Time	
1	<i>[Signature]</i>	Pace MN	6/5/17 1330			
2	<i>Fed Ex</i>		<i>6/6/17 915</i>	<i>[Signature]</i>	<i>6/6/17 915</i>	
3						

Cooler Temperature on Receipt 3.4 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

# WO#: 2055652

PM: CMM

Due Date: 06/15/17

CLIENT: PASI-MINN

Project: \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:	<input type="checkbox"/> Therm Fisher IR 5
	<input type="checkbox"/> Therm Fisher IR 6
	<input checked="" type="checkbox"/> Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-06-17 JB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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**Chain of Custody**

**WO# 1288653**

PM HRZ Due Date 06/19/17  
 CLIENT: PACE MPLS

**pace analytical**  
 www.pacelabs.com  
 Page 3 of 34

**Workorder:** 10390960

**Workorder Name:** 1497 UPRR\_Freeman

**Owner Received Date:** 6/3/2017

**Results Requested By:** 6/19/2017

Report To		Subcontract To					Requested Analysis												LAB USE ONLY									
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					5632354 / 5310 TOC																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																						
						H2SO4																						
1	FD02-GW-060117	PS	6/1/2017 08:00	10390960001	Water	3																						
2																												
3																												
4																												
5																												

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>Juanita Ortiz</i>	Pace MN 6/5/17 1330	<i>[Signature]</i>	6/5/17 1730														
	6/5/17 2135	<i>[Signature]</i>	6/5/17 2030														

Cooler Temperature on Receipt 1.4 °C Custody Seal  or N Received on Ice  or N Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.


**Sample Condition Upon Receipt**

Client Name:

*Pace MV*

Project #:

**WO# : 1288653**



1288653

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional:    Proj. Due Date:    Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: *Hot Pack*      Temp Blank?  Yes  No

Thermometer Used:  140792808      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: *1.1*      Cooler Temp Corrected °C: *1.4*      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: *-0.3*      Date and Initials of Person Examining Contents: *JPC 6/15/17*

Comments: *mv le-17*

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <i>WOT</i>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE    Y    N

TEMPERATURE WAIVER ON FILE    Y    N

Project Manager Review:

*[Signature]*

Date: *6.6.17*

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 15, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

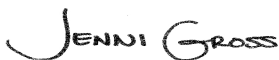
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390961

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390961

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390961001	FD02-GW-060117	Water	06/01/17 08:00	06/03/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

---

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390961001	FD02-GW-060117	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390961001</b>	<b>FD02-GW-060117</b>					
EPA 8260B	Acetone	35.2	ug/L	20.0	06/14/17 14:01	L1

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 479522

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2611900)
- Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2611900)
- Tetrahydrofuran

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479522

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390962001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2611901)
- Acetone
- Tetrahydrofuran
- MSD (Lab ID: 2611902)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

QC Batch: 479522

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390962001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- Acetone
- Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

Sample: **FD02-GW-060117** Lab ID: **10390961001** Collected: 06/01/17 08:00 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 14:01	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/14/17 14:01	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 14:01	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 14:01	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/14/17 14:01	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 14:01	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/14/17 14:01	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/14/17 14:01	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/14/17 14:01	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/14/17 14:01	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/14/17 14:01	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/14/17 14:01	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/14/17 14:01	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/14/17 14:01	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/14/17 14:01	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/14/17 14:01	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/14/17 14:01	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/14/17 14:01	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/14/17 14:01	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/14/17 14:01	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/14/17 14:01	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/14/17 14:01	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/14/17 14:01	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/14/17 14:01	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/14/17 14:01	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/14/17 14:01	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/14/17 14:01	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/14/17 14:01	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/14/17 14:01	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/14/17 14:01	108-10-1	
Acetone	35.2	ug/L	20.0	0.64	1		06/14/17 14:01	67-64-1	L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/14/17 14:01	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/14/17 14:01	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/14/17 14:01	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/14/17 14:01	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/14/17 14:01	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/14/17 14:01	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/14/17 14:01	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/14/17 14:01	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/14/17 14:01	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/14/17 14:01	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/14/17 14:01	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/14/17 14:01	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/14/17 14:01	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/14/17 14:01	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/14/17 14:01	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

**Sample: FD02-GW-060117**      **Lab ID: 10390961001**      Collected: 06/01/17 08:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/14/17 14:01	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/14/17 14:01	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/14/17 14:01	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/14/17 14:01	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/14/17 14:01	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/14/17 14:01	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/14/17 14:01	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/14/17 14:01	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/14/17 14:01	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/14/17 14:01	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/14/17 14:01	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/14/17 14:01	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/14/17 14:01	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/14/17 14:01	109-99-9	
Toluene	<0.059	ug/L	1.0	0.059	1		06/14/17 14:01	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/14/17 14:01	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/14/17 14:01	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/14/17 14:01	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/14/17 14:01	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/14/17 14:01	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/14/17 14:01	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/14/17 14:01	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/14/17 14:01	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/14/17 14:01	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/14/17 14:01	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/14/17 14:01	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/14/17 14:01	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/14/17 14:01	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/14/17 14:01	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/14/17 14:01	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/14/17 14:01	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/14/17 14:01	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/14/17 14:01	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/14/17 14:01	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	96	%	75-137		1		06/14/17 14:01	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/14/17 14:01	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/14/17 14:01	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390961

QC Batch: 479522 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10390961001

METHOD BLANK: 2611899 Matrix: Water  
Associated Lab Samples: 10390961001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/14/17 11:50	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/14/17 11:50	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/14/17 11:50	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/14/17 11:50	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/14/17 11:50	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/14/17 11:50	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/14/17 11:50	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/14/17 11:50	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/14/17 11:50	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/14/17 11:50	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/14/17 11:50	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/14/17 11:50	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/14/17 11:50	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/14/17 11:50	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/14/17 11:50	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/14/17 11:50	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/14/17 11:50	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/14/17 11:50	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/14/17 11:50	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/14/17 11:50	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/14/17 11:50	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/14/17 11:50	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/14/17 11:50	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/14/17 11:50	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/14/17 11:50	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/14/17 11:50	
Acetone	ug/L	<0.64	20.0	0.64	06/14/17 11:50	
Acrolein	ug/L	<2.1	10.0	2.1	06/14/17 11:50	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/14/17 11:50	
Benzene	ug/L	<0.042	0.50	0.042	06/14/17 11:50	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/14/17 11:50	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/14/17 11:50	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/14/17 11:50	
Bromoform	ug/L	<0.11	4.0	0.11	06/14/17 11:50	
Bromomethane	ug/L	<0.20	4.0	0.20	06/14/17 11:50	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/14/17 11:50	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/14/17 11:50	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390961

METHOD BLANK: 2611899 Matrix: Water  
Associated Lab Samples: 10390961001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/14/17 11:50	
Chloroethane	ug/L	<0.12	1.0	0.12	06/14/17 11:50	
Chloroform	ug/L	<0.21	1.0	0.21	06/14/17 11:50	
Chloromethane	ug/L	<0.080	4.0	0.080	06/14/17 11:50	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/14/17 11:50	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/14/17 11:50	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/14/17 11:50	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/14/17 11:50	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/14/17 11:50	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/14/17 11:50	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/14/17 11:50	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/14/17 11:50	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/14/17 11:50	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/14/17 11:50	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/14/17 11:50	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/14/17 11:50	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/14/17 11:50	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/14/17 11:50	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/14/17 11:50	
Naphthalene	ug/L	<0.064	1.0	0.064	06/14/17 11:50	
o-Xylene	ug/L	<0.044	0.50	0.044	06/14/17 11:50	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/14/17 11:50	
Styrene	ug/L	<0.056	0.50	0.056	06/14/17 11:50	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/14/17 11:50	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/14/17 11:50	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/14/17 11:50	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/14/17 11:50	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/14/17 11:50	
Toluene	ug/L	<0.059	1.0	0.059	06/14/17 11:50	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/14/17 11:50	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/14/17 11:50	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/14/17 11:50	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/14/17 11:50	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/14/17 11:50	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/14/17 11:50	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/14/17 11:50	
1,2-Dichloroethane-d4 (S)	%	96	75-137		06/14/17 11:50	
4-Bromofluorobenzene (S)	%	102	75-125		06/14/17 11:50	
Toluene-d8 (S)	%	96	75-125		06/14/17 11:50	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

LABORATORY CONTROL SAMPLE: 2611900

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	109	75-136	
1,1,1-Trichloroethane	ug/L	20	21.0	105	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.6	103	71-138	
1,1,2-Trichloroethane	ug/L	20	20.1	100	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.4	107	69-126	
1,1-Dichloroethane	ug/L	20	20.8	104	75-125	
1,1-Dichloroethene	ug/L	20	21.2	106	75-125	
1,1-Dichloropropene	ug/L	20	22.0	110	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	75-125	
1,2,3-Trichloropropane	ug/L	20	21.4	107	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.0	105	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.0	106	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.9	110	75-125	
1,2-Dichlorobenzene	ug/L	20	21.5	107	75-125	
1,2-Dichloroethane	ug/L	20	20.3	102	70-125	
1,2-Dichloroethene (Total)	ug/L	40	42.2	106	75-125	
1,2-Dichloropropane	ug/L	20	21.1	106	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	22.2	111	75-125	
1,4-Dichlorobenzene	ug/L	20	20.0	100	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	380	95	64-140	
2,2,4-Trimethylpentane	ug/L	20	22.0	110	68-125	
2,2-Dichloropropane	ug/L	20	22.8	114	70-131	
2-Butanone (MEK)	ug/L	100	108	108	69-125	
2-Chlorotoluene	ug/L	20	20.5	103	75-125	
2-Hexanone	ug/L	100	115	115	73-129	
4-Chlorotoluene	ug/L	20	21.0	105	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	73-125	
Acetone	ug/L	100	129	129	66-126 L1	
Acrolein	ug/L	200	230	115	56-150	
Acrylonitrile	ug/L	200	218	109	68-129	
Benzene	ug/L	20	20.4	102	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	22.4	112	75-126	
Bromodichloromethane	ug/L	20	21.3	106	75-133	
Bromoform	ug/L	20	20.6	103	62-142	
Bromomethane	ug/L	20	17.8	89	34-143	
Carbon disulfide	ug/L	20	20.7	103	71-125	
Carbon tetrachloride	ug/L	20	22.7	114	71-145	
Chlorobenzene	ug/L	20	20.5	102	75-125	
Chloroethane	ug/L	20	21.3	107	75-125	
Chloroform	ug/L	20	20.4	102	75-125	
Chloromethane	ug/L	20	20.3	102	54-125	
cis-1,2-Dichloroethene	ug/L	20	21.3	107	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.5	103	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

LABORATORY CONTROL SAMPLE: 2611900

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.0	105	74-141	
Dibromomethane	ug/L	20	23.0	115	75-125	
Dichlorodifluoromethane	ug/L	20	19.8	99	59-130	
Dichlorofluoromethane	ug/L	20	21.3	106	75-125	
Diisopropyl ether	ug/L	20	21.1	105	69-125	
Ethyl-tert-butyl ether	ug/L	20	22.4	112	73-125	
Ethylbenzene	ug/L	20	19.8	99	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.9	114	75-131	
Isopropylbenzene (Cumene)	ug/L	20	21.4	107	75-125	
m&p-Xylene	ug/L	40	42.5	106	75-125	
Methyl-tert-butyl ether	ug/L	20	22.2	111	75-125	
Methylene Chloride	ug/L	20	19.8	99	73-125	
n-Butylbenzene	ug/L	20	21.4	107	75-125	
n-Propylbenzene	ug/L	20	19.8	99	75-125	
Naphthalene	ug/L	20	19.3	96	74-125	
o-Xylene	ug/L	20	22.1	111	75-125	
p-Isopropyltoluene	ug/L	20	19.8	99	75-125	
sec-Butylbenzene	ug/L	20	21.2	106	75-125	
Styrene	ug/L	20	20.2	101	75-125	
tert-Amylmethyl ether	ug/L	20	21.9	110	71-126	
tert-Butyl Alcohol	ug/L	200	197	99	69-131	
tert-Butylbenzene	ug/L	20	20.7	103	75-125	
Tetrachloroethene	ug/L	20	20.6	103	75-125	
Tetrahydrofuran	ug/L	200	256	128	65-127 L3	
Toluene	ug/L	20	18.3	91	75-125	
trans-1,2-Dichloroethene	ug/L	20	20.9	105	75-125	
trans-1,3-Dichloropropene	ug/L	20	21.2	106	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	51.0	102	30-150	
Trichloroethene	ug/L	20	20.3	102	75-125	
Trichlorofluoromethane	ug/L	20	21.9	110	71-140	
Vinyl acetate	ug/L	20	22.2	111	68-137	
Vinyl chloride	ug/L	20	21.7	108	70-125	
Xylene (Total)	ug/L	60	64.7	108	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611901 2611902

Parameter	Units	2611901		2611902		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10390962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	20.7	22.4	104	112	75-137	8	30	
1,1,1-Trichloroethane	ug/L	<0.057	20	20	21.2	23.2	106	116	75-139	9	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	18.2	20.1	91	100	60-142	10	30	
1,1,2-Trichloroethane	ug/L	<0.064	20	20	17.9	19.2	90	96	75-128	7	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

Parameter	Units	2611901		2611902		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10390962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	24.6	27.1	123	136	62-150	10	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	20.2	22.0	101	110	70-129	9	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	21.5	23.6	108	118	67-141	9	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	22.5	24.3	113	121	64-144	7	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	19.5	21.3	97	107	66-139	9	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.0	20.5	95	103	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	20.7	22.4	103	112	65-138	8	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	18.9	20.6	94	103	65-143	9	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	45.9	51.1	92	102	61-134	11	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	19.7	21.7	98	108	74-129	10	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	19.7	21.8	99	109	68-135	10	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	18.7	19.8	93	99	73-125	6	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	41.9	44.9	105	112	69-134	7	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	19.8	21.5	99	108	64-130	8	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	20.5	22.2	103	111	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	19.4	21.2	97	106	69-135	9	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.7	21.5	99	108	67-128	9	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	19.0	20.7	95	104	66-134	9	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	385	411	96	103	58-140	7	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	27.1	28.9	135	144	48-150	6	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	22.9	24.7	114	123	50-150	7	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	86.9	95.1	87	95	58-125	9	30		
2-Chlorotoluene	ug/L	<0.084	20	20	19.8	21.5	99	108	65-138	8	30		
2-Hexanone	ug/L	<0.19	100	100	95.5	105	96	105	61-134	9	30		
4-Chlorotoluene	ug/L	<0.048	20	20	20.1	21.8	100	109	68-135	8	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	92.5	103	92	103	61-130	11	30		
Acetone	ug/L	<0.64	100	100	160	171	160	171	51-140	7	30	M0	
Acrolein	ug/L	<2.1	200	200	245	270	123	135	48-150	10	30		
Acrylonitrile	ug/L	<0.49	200	200	185	203	93	102	55-134	9	30		
Benzene	ug/L	<0.042	20	20	19.7	21.4	98	107	63-132	8	30		
Bromobenzene	ug/L	<0.087	20	20	19.2	20.9	96	104	67-138	8	30		
Bromochloromethane	ug/L	<0.082	20	20	20.5	21.6	103	108	66-138	5	30		
Bromodichloromethane	ug/L	<0.068	20	20	19.7	21.2	99	106	75-137	7	30		
Bromoform	ug/L	<0.11	20	20	18.8	20.4	94	102	65-129	8	30		
Bromomethane	ug/L	<0.20	20	20	20.9	23.1	105	116	41-150	10	30		
Carbon disulfide	ug/L	<0.20	20	20	21.6	23.2	108	116	72-132	7	30		
Carbon tetrachloride	ug/L	<0.079	20	20	23.8	25.8	119	129	75-150	8	30		
Chlorobenzene	ug/L	<0.066	20	20	19.5	21.1	97	105	73-127	8	30		
Chloroethane	ug/L	<0.12	20	20	22.1	22.8	111	114	74-138	3	30		
Chloroform	ug/L	<0.21	20	20	19.5	21.5	98	107	74-125	9	30		
Chloromethane	ug/L	<0.080	20	20	21.5	21.5	108	108	58-129	0	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	21.0	22.3	105	111	63-135	6	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.0	20.5	95	102	66-129	7	30		
Dibromochloromethane	ug/L	<0.048	20	20	18.8	20.7	94	103	75-133	10	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

Parameter	Units	10390962001		2611901		2611902		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<0.14	20	20	21.0	22.9	105	114	68-134	9	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	23.4	24.0	117	120	72-150	3	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	21.9	22.6	109	113	75-129	3	30		
Diisopropyl ether	ug/L	<0.050	20	20	19.4	20.8	97	104	62-128	7	30		
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	20.3	22.0	101	110	63-132	8	30		
Ethylbenzene	ug/L	<0.075	20	20	19.4	21.2	97	106	72-130	9	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	25.8	27.8	129	139	71-150	8	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	21.1	23.2	105	116	70-136	10	30		
m&p-Xylene	ug/L	<0.11	40	40	41.5	45.0	104	113	64-142	8	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.7	21.2	98	106	72-125	8	30		
Methylene Chloride	ug/L	<0.097	20	20	18.5	19.8	92	99	60-132	7	30		
n-Butylbenzene	ug/L	<0.16	20	20	22.5	24.0	112	120	60-150	6	30		
n-Propylbenzene	ug/L	<0.049	20	20	20.0	21.8	100	109	63-142	9	30		
Naphthalene	ug/L	<0.064	20	20	18.0	20.0	90	100	67-125	11	30		
o-Xylene	ug/L	<0.044	20	20	21.2	22.5	106	113	60-143	6	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	20.4	21.9	102	109	64-146	7	30		
sec-Butylbenzene	ug/L	<0.094	20	20	22.0	23.7	110	119	67-144	8	30		
Styrene	ug/L	<0.056	20	20	19.0	20.5	95	102	67-136	8	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	19.3	20.8	97	104	60-134	7	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	198	214	99	107	56-146	8	30		
tert-Butylbenzene	ug/L	<0.051	20	20	20.9	23.1	105	116	68-135	10	30		
Tetrachloroethene	ug/L	<0.13	20	20	20.7	22.9	103	115	67-148	10	30		
Tetrahydrofuran	ug/L	<1.5	200	200	352	391	176	196	51-141	11	30	MO	
Toluene	ug/L	0.065J	20	20	18.1	19.5	90	97	61-140	7	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	20.9	22.7	105	113	62-138	8	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	19.5	21.2	98	106	67-134	8	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	44.6	49.3	89	99	30-150	10	30		
Trichloroethene	ug/L	<0.044	20	20	19.9	22.0	100	110	64-149	10	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	24.6	25.4	123	127	75-150	3	30		
Vinyl acetate	ug/L	<0.12	20	20	19.5	21.5	97	108	49-143	10	30		
Vinyl chloride	ug/L	<0.098	20	20	23.3	24.1	117	120	75-133	3	30		
Xylene (Total)	ug/L	<0.15	60	60	62.8	67.6	105	113	63-142	7	30		
1,2-Dichloroethane-d4 (S)	%						94	94	75-137				
4-Bromofluorobenzene (S)	%						101	101	75-125				
Toluene-d8 (S)	%						99	99	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390961

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390961

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10390961001	FD02-GW-060117	EPA 8260B	479522		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10390961

**Section A**

**Section B**

**Section C**

Page :        Of   1  

**Required Client Information:**

**Required Project Information:**

**Invoice Information:**

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR
Email: mark.ochsner@ch2n.com	Purchase Order #:	Address: CAS
Phone: _____ Fax: _____	Project Name: UPRR Freeman	Pace Quote:
Requested Due Date/Circle: 24 Hour / 5 Day / <b>10 Day</b>	Project #: 1497	Pace Project Manager:
		Pace Profile #: 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box... (A-Z, 0-9 /, -) Sample ids must be unique	MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives											Analysis Test	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	
			DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Low Level VOCs by 8260	6010/7470 TAL Metals	2320 Alkalinity		Chloride, Sulfate, Nitrate 300.0	2640 TDS	TOC 8310	Sulfide 4500	Methane, Ethane, Ethene RSK175	BOD 10360W	COD 410.4	CSIA of CTET (8260 Must be analyzed)				
																													Requested Analysis Filtered (Y/N)			
1	FD02-GW-060117	WTG			6-17	08:00	3				X																				001	
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	<i>Johnathan</i>	6-17	15:00	<i>Gary Pace</i>	6/17	9:15	3.7	Y	Y	Y

Page 19 of 20

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:						
SIGNATURE of SAMPLER:		DATE Signed:				



Document Name:  
**Sample Condition Upon Receipt Form - ESI**

Document No.:  
**F-MN-L-210-rev.22**

Document Revised: 21Dec2016  
Page 1 of 2

Issuing Authority:  
Pace Minnesota Quality Office

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name:  
**CH2M Hill**

Project #:  
**WO# : 10390961**



10390961

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other: \_\_\_\_\_

Tracking Number: **7722 2739 9098**

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
Packing Material:  Bubble Wrap  Bubble Bags  None  Other: **FB** Temp Blank?  Yes  No  
Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **3.6** Cooler Temp Corrected (°C): **3.7** Biological Tissue Frozen?  Yes  No  N/A  
Temp should be above freezing to 6°C Correction Factor: **40.1** Date and Initials of Person Examining Contents: **RBG/3/17**

USDA Regulated Soil (  N/A, water sample)  
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <b>RBG/3/17</b> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide)	<b>1</b>
Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	Initial when completed:
Per method, VOA pH is checked after analysis	Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <b>RSK Needs Head space</b>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**Just VOA JDD 6-3-17**

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>11:20</b>	Temp: <b>3.6</b>	Corrected Temp: <b>3.7</b>
Time: <b>11:44</b>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: JENNI GROSS Date: 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 15, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

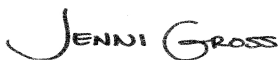
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390962001	Stark-GW-060117	Water	06/01/17 11:00	06/03/17 09:15

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390962001	Stark-GW-060117	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390962001</b>	<b>Stark-GW-060117</b>					
EPA 8260B	Toluene	0.065J	ug/L	1.0	06/14/17 13:39	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

**General Information:**

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 479522

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2611900)
- Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2611900)
- Tetrahydrofuran

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479522

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390962001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2611901)
- Acetone
- Tetrahydrofuran
- MSD (Lab ID: 2611902)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

QC Batch: 479522

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390962001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- Acetone
- Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

Sample: **Stark-GW-060117** Lab ID: **10390962001** Collected: 06/01/17 11:00 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 13:39	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/14/17 13:39	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 13:39	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 13:39	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/14/17 13:39	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 13:39	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/14/17 13:39	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/14/17 13:39	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/14/17 13:39	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/14/17 13:39	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/14/17 13:39	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/14/17 13:39	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/14/17 13:39	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/14/17 13:39	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/14/17 13:39	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/14/17 13:39	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/14/17 13:39	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/14/17 13:39	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/14/17 13:39	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/14/17 13:39	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/14/17 13:39	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/14/17 13:39	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/14/17 13:39	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/14/17 13:39	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/14/17 13:39	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/14/17 13:39	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/14/17 13:39	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/14/17 13:39	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/14/17 13:39	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/14/17 13:39	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/14/17 13:39	67-64-1	L3,M0
Acrolein	<2.1	ug/L	10.0	2.1	1		06/14/17 13:39	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/14/17 13:39	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/14/17 13:39	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/14/17 13:39	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/14/17 13:39	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/14/17 13:39	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/14/17 13:39	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/14/17 13:39	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/14/17 13:39	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/14/17 13:39	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/14/17 13:39	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/14/17 13:39	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/14/17 13:39	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/14/17 13:39	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/14/17 13:39	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

**Sample: Stark-GW-060117**      **Lab ID: 10390962001**      Collected: 06/01/17 11:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/14/17 13:39	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/14/17 13:39	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/14/17 13:39	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/14/17 13:39	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/14/17 13:39	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/14/17 13:39	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/14/17 13:39	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/14/17 13:39	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/14/17 13:39	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/14/17 13:39	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/14/17 13:39	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/14/17 13:39	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/14/17 13:39	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/14/17 13:39	109-99-9	M0
Toluene	0.065J	ug/L	1.0	0.059	1		06/14/17 13:39	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/14/17 13:39	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/14/17 13:39	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/14/17 13:39	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/14/17 13:39	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/14/17 13:39	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/14/17 13:39	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/14/17 13:39	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/14/17 13:39	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/14/17 13:39	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/14/17 13:39	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/14/17 13:39	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/14/17 13:39	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/14/17 13:39	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/14/17 13:39	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/14/17 13:39	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/14/17 13:39	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/14/17 13:39	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/14/17 13:39	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/14/17 13:39	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	95	%	75-137		1		06/14/17 13:39	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/14/17 13:39	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/14/17 13:39	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

QC Batch: 479522 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10390962001

METHOD BLANK: 2611899 Matrix: Water  
Associated Lab Samples: 10390962001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/14/17 11:50	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/14/17 11:50	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/14/17 11:50	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/14/17 11:50	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/14/17 11:50	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/14/17 11:50	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/14/17 11:50	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/14/17 11:50	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/14/17 11:50	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/14/17 11:50	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/14/17 11:50	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/14/17 11:50	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/14/17 11:50	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/14/17 11:50	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/14/17 11:50	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/14/17 11:50	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/14/17 11:50	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/14/17 11:50	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/14/17 11:50	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/14/17 11:50	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/14/17 11:50	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/14/17 11:50	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/14/17 11:50	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/14/17 11:50	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/14/17 11:50	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/14/17 11:50	
Acetone	ug/L	<0.64	20.0	0.64	06/14/17 11:50	
Acrolein	ug/L	<2.1	10.0	2.1	06/14/17 11:50	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/14/17 11:50	
Benzene	ug/L	<0.042	0.50	0.042	06/14/17 11:50	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/14/17 11:50	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/14/17 11:50	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/14/17 11:50	
Bromoform	ug/L	<0.11	4.0	0.11	06/14/17 11:50	
Bromomethane	ug/L	<0.20	4.0	0.20	06/14/17 11:50	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/14/17 11:50	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/14/17 11:50	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

METHOD BLANK: 2611899 Matrix: Water  
Associated Lab Samples: 10390962001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/14/17 11:50	
Chloroethane	ug/L	<0.12	1.0	0.12	06/14/17 11:50	
Chloroform	ug/L	<0.21	1.0	0.21	06/14/17 11:50	
Chloromethane	ug/L	<0.080	4.0	0.080	06/14/17 11:50	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/14/17 11:50	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/14/17 11:50	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/14/17 11:50	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/14/17 11:50	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/14/17 11:50	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/14/17 11:50	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/14/17 11:50	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/14/17 11:50	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/14/17 11:50	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/14/17 11:50	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/14/17 11:50	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/14/17 11:50	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/14/17 11:50	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/14/17 11:50	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/14/17 11:50	
Naphthalene	ug/L	<0.064	1.0	0.064	06/14/17 11:50	
o-Xylene	ug/L	<0.044	0.50	0.044	06/14/17 11:50	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/14/17 11:50	
Styrene	ug/L	<0.056	0.50	0.056	06/14/17 11:50	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/14/17 11:50	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/14/17 11:50	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/14/17 11:50	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/14/17 11:50	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/14/17 11:50	
Toluene	ug/L	<0.059	1.0	0.059	06/14/17 11:50	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/14/17 11:50	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/14/17 11:50	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/14/17 11:50	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/14/17 11:50	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/14/17 11:50	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/14/17 11:50	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/14/17 11:50	
1,2-Dichloroethane-d4 (S)	%	96	75-137		06/14/17 11:50	
4-Bromofluorobenzene (S)	%	102	75-125		06/14/17 11:50	
Toluene-d8 (S)	%	96	75-125		06/14/17 11:50	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

LABORATORY CONTROL SAMPLE: 2611900

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	109	75-136	
1,1,1-Trichloroethane	ug/L	20	21.0	105	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.6	103	71-138	
1,1,2-Trichloroethane	ug/L	20	20.1	100	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.4	107	69-126	
1,1-Dichloroethane	ug/L	20	20.8	104	75-125	
1,1-Dichloroethene	ug/L	20	21.2	106	75-125	
1,1-Dichloropropene	ug/L	20	22.0	110	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	75-125	
1,2,3-Trichloropropane	ug/L	20	21.4	107	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.0	105	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.0	106	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.9	110	75-125	
1,2-Dichlorobenzene	ug/L	20	21.5	107	75-125	
1,2-Dichloroethane	ug/L	20	20.3	102	70-125	
1,2-Dichloroethene (Total)	ug/L	40	42.2	106	75-125	
1,2-Dichloropropane	ug/L	20	21.1	106	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	22.2	111	75-125	
1,4-Dichlorobenzene	ug/L	20	20.0	100	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	380	95	64-140	
2,2,4-Trimethylpentane	ug/L	20	22.0	110	68-125	
2,2-Dichloropropane	ug/L	20	22.8	114	70-131	
2-Butanone (MEK)	ug/L	100	108	108	69-125	
2-Chlorotoluene	ug/L	20	20.5	103	75-125	
2-Hexanone	ug/L	100	115	115	73-129	
4-Chlorotoluene	ug/L	20	21.0	105	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	73-125	
Acetone	ug/L	100	129	129	66-126 L1	
Acrolein	ug/L	200	230	115	56-150	
Acrylonitrile	ug/L	200	218	109	68-129	
Benzene	ug/L	20	20.4	102	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	22.4	112	75-126	
Bromodichloromethane	ug/L	20	21.3	106	75-133	
Bromoform	ug/L	20	20.6	103	62-142	
Bromomethane	ug/L	20	17.8	89	34-143	
Carbon disulfide	ug/L	20	20.7	103	71-125	
Carbon tetrachloride	ug/L	20	22.7	114	71-145	
Chlorobenzene	ug/L	20	20.5	102	75-125	
Chloroethane	ug/L	20	21.3	107	75-125	
Chloroform	ug/L	20	20.4	102	75-125	
Chloromethane	ug/L	20	20.3	102	54-125	
cis-1,2-Dichloroethene	ug/L	20	21.3	107	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.5	103	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

LABORATORY CONTROL SAMPLE: 2611900

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.0	105	74-141	
Dibromomethane	ug/L	20	23.0	115	75-125	
Dichlorodifluoromethane	ug/L	20	19.8	99	59-130	
Dichlorofluoromethane	ug/L	20	21.3	106	75-125	
Diisopropyl ether	ug/L	20	21.1	105	69-125	
Ethyl-tert-butyl ether	ug/L	20	22.4	112	73-125	
Ethylbenzene	ug/L	20	19.8	99	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.9	114	75-131	
Isopropylbenzene (Cumene)	ug/L	20	21.4	107	75-125	
m&p-Xylene	ug/L	40	42.5	106	75-125	
Methyl-tert-butyl ether	ug/L	20	22.2	111	75-125	
Methylene Chloride	ug/L	20	19.8	99	73-125	
n-Butylbenzene	ug/L	20	21.4	107	75-125	
n-Propylbenzene	ug/L	20	19.8	99	75-125	
Naphthalene	ug/L	20	19.3	96	74-125	
o-Xylene	ug/L	20	22.1	111	75-125	
p-Isopropyltoluene	ug/L	20	19.8	99	75-125	
sec-Butylbenzene	ug/L	20	21.2	106	75-125	
Styrene	ug/L	20	20.2	101	75-125	
tert-Amylmethyl ether	ug/L	20	21.9	110	71-126	
tert-Butyl Alcohol	ug/L	200	197	99	69-131	
tert-Butylbenzene	ug/L	20	20.7	103	75-125	
Tetrachloroethene	ug/L	20	20.6	103	75-125	
Tetrahydrofuran	ug/L	200	256	128	65-127 L3	
Toluene	ug/L	20	18.3	91	75-125	
trans-1,2-Dichloroethene	ug/L	20	20.9	105	75-125	
trans-1,3-Dichloropropene	ug/L	20	21.2	106	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	51.0	102	30-150	
Trichloroethene	ug/L	20	20.3	102	75-125	
Trichlorofluoromethane	ug/L	20	21.9	110	71-140	
Vinyl acetate	ug/L	20	22.2	111	68-137	
Vinyl chloride	ug/L	20	21.7	108	70-125	
Xylene (Total)	ug/L	60	64.7	108	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611901 2611902

Parameter	Units	2611901		2611902		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20.7	22.4	104	112	75-137	8	30	
1,1,1-Trichloroethane	ug/L	<0.057	20	21.2	23.2	106	116	75-139	9	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	18.2	20.1	91	100	60-142	10	30	
1,1,2-Trichloroethane	ug/L	<0.064	20	17.9	19.2	90	96	75-128	7	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

Parameter	Units	10390962001		2611901		2611902		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	24.6	27.1	123	136	62-150	10	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	20.2	22.0	101	110	70-129	9	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	21.5	23.6	108	118	67-141	9	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	22.5	24.3	113	121	64-144	7	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	19.5	21.3	97	107	66-139	9	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.0	20.5	95	103	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	20.7	22.4	103	112	65-138	8	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	18.9	20.6	94	103	65-143	9	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	45.9	51.1	92	102	61-134	11	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	19.7	21.7	98	108	74-129	10	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	19.7	21.8	99	109	68-135	10	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	18.7	19.8	93	99	73-125	6	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	41.9	44.9	105	112	69-134	7	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	19.8	21.5	99	108	64-130	8	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	20.5	22.2	103	111	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	19.4	21.2	97	106	69-135	9	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.7	21.5	99	108	67-128	9	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	19.0	20.7	95	104	66-134	9	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	385	411	96	103	58-140	7	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	27.1	28.9	135	144	48-150	6	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	22.9	24.7	114	123	50-150	7	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	86.9	95.1	87	95	58-125	9	30		
2-Chlorotoluene	ug/L	<0.084	20	20	19.8	21.5	99	108	65-138	8	30		
2-Hexanone	ug/L	<0.19	100	100	95.5	105	96	105	61-134	9	30		
4-Chlorotoluene	ug/L	<0.048	20	20	20.1	21.8	100	109	68-135	8	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	92.5	103	92	103	61-130	11	30		
Acetone	ug/L	<0.64	100	100	160	171	160	171	51-140	7	30	M0	
Acrolein	ug/L	<2.1	200	200	245	270	123	135	48-150	10	30		
Acrylonitrile	ug/L	<0.49	200	200	185	203	93	102	55-134	9	30		
Benzene	ug/L	<0.042	20	20	19.7	21.4	98	107	63-132	8	30		
Bromobenzene	ug/L	<0.087	20	20	19.2	20.9	96	104	67-138	8	30		
Bromochloromethane	ug/L	<0.082	20	20	20.5	21.6	103	108	66-138	5	30		
Bromodichloromethane	ug/L	<0.068	20	20	19.7	21.2	99	106	75-137	7	30		
Bromoform	ug/L	<0.11	20	20	18.8	20.4	94	102	65-129	8	30		
Bromomethane	ug/L	<0.20	20	20	20.9	23.1	105	116	41-150	10	30		
Carbon disulfide	ug/L	<0.20	20	20	21.6	23.2	108	116	72-132	7	30		
Carbon tetrachloride	ug/L	<0.079	20	20	23.8	25.8	119	129	75-150	8	30		
Chlorobenzene	ug/L	<0.066	20	20	19.5	21.1	97	105	73-127	8	30		
Chloroethane	ug/L	<0.12	20	20	22.1	22.8	111	114	74-138	3	30		
Chloroform	ug/L	<0.21	20	20	19.5	21.5	98	107	74-125	9	30		
Chloromethane	ug/L	<0.080	20	20	21.5	21.5	108	108	58-129	0	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	21.0	22.3	105	111	63-135	6	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.0	20.5	95	102	66-129	7	30		
Dibromochloromethane	ug/L	<0.048	20	20	18.8	20.7	94	103	75-133	10	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

Parameter	Units	10390962001		2611901		2611902		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<0.14	20	20	21.0	22.9	105	114	68-134	9	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	23.4	24.0	117	120	72-150	3	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	21.9	22.6	109	113	75-129	3	30		
Diisopropyl ether	ug/L	<0.050	20	20	19.4	20.8	97	104	62-128	7	30		
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	20.3	22.0	101	110	63-132	8	30		
Ethylbenzene	ug/L	<0.075	20	20	19.4	21.2	97	106	72-130	9	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	25.8	27.8	129	139	71-150	8	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	21.1	23.2	105	116	70-136	10	30		
m&p-Xylene	ug/L	<0.11	40	40	41.5	45.0	104	113	64-142	8	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.7	21.2	98	106	72-125	8	30		
Methylene Chloride	ug/L	<0.097	20	20	18.5	19.8	92	99	60-132	7	30		
n-Butylbenzene	ug/L	<0.16	20	20	22.5	24.0	112	120	60-150	6	30		
n-Propylbenzene	ug/L	<0.049	20	20	20.0	21.8	100	109	63-142	9	30		
Naphthalene	ug/L	<0.064	20	20	18.0	20.0	90	100	67-125	11	30		
o-Xylene	ug/L	<0.044	20	20	21.2	22.5	106	113	60-143	6	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	20.4	21.9	102	109	64-146	7	30		
sec-Butylbenzene	ug/L	<0.094	20	20	22.0	23.7	110	119	67-144	8	30		
Styrene	ug/L	<0.056	20	20	19.0	20.5	95	102	67-136	8	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	19.3	20.8	97	104	60-134	7	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	198	214	99	107	56-146	8	30		
tert-Butylbenzene	ug/L	<0.051	20	20	20.9	23.1	105	116	68-135	10	30		
Tetrachloroethene	ug/L	<0.13	20	20	20.7	22.9	103	115	67-148	10	30		
Tetrahydrofuran	ug/L	<1.5	200	200	352	391	176	196	51-141	11	30	MO	
Toluene	ug/L	0.065J	20	20	18.1	19.5	90	97	61-140	7	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	20.9	22.7	105	113	62-138	8	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	19.5	21.2	98	106	67-134	8	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	44.6	49.3	89	99	30-150	10	30		
Trichloroethene	ug/L	<0.044	20	20	19.9	22.0	100	110	64-149	10	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	24.6	25.4	123	127	75-150	3	30		
Vinyl acetate	ug/L	<0.12	20	20	19.5	21.5	97	108	49-143	10	30		
Vinyl chloride	ug/L	<0.098	20	20	23.3	24.1	117	120	75-133	3	30		
Xylene (Total)	ug/L	<0.15	60	60	62.8	67.6	105	113	63-142	7	30		
1,2-Dichloroethane-d4 (S)	%						94	94	75-137				
4-Bromofluorobenzene (S)	%						101	101	75-125				
Toluene-d8 (S)	%						99	99	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390962

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390962

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10390962001	Stark-GW-060117	EPA 8260B	479522		

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### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10390962

<b>Section A</b> Required Client Information: Company: CH2M Hill Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201 Email: mark.Ochsner@ch2n.com Phone: _____ Fax: _____ Requested Due Date/Circle: 24 Hour / 5 Day / <b>10 Day</b>	<b>Section B</b> Required Project Information: Report To: Mark Ochsner, Brad Ostapkowicz Copy To: Steve Demus Purchase Order #: Project Name: UPRR_Freeman Project #: 1497	<b>Section C</b> Invoice Information: Attention: Gary Honeyman Company Name: UPRR Address: CAS Pace Quote: Pace Project Manager: Pace Profile #: 36447 / 4	Page: _____ Of _____
--	--	---	----------------------

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test	Requested Analysis Filtered (Y/N)	State / Location	WA / Freeman	Residual Chlorine (Y/N)									
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Low Level VOCs by 8260	60107/470 TAL Metals						2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5610	Sulfide 4500	Methane, Ethane, Ethene RSK175	BOD 10360W	COD 410.4	CSIA of C1ET (8260 Must be analyzed)
				DATE	TIME	DATE	TIME																										
1	Stark-GW-060117	WT G		6-1-17	11:00	9		X							X												MS/MSD						
2																																	
3																																	
4																																	
5																																	
6																																	
7																																	
8																																	
9																																	
10																																	
11																																	
12																																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	J.A. Hill/CH2M	6-2-17	15:00	M.J. Hill/CH2M	6/3/17	9:15	37	Y	Y	Y

<b>SAMPLER NAME AND SIGNATURE</b> PRINT Name of SAMPLER: SIGNATURE of SAMPLER:			DATE Signed:	TEMP in C Received on Ice: (Y/N) Custody Sealed: (Y/N) Cooler: (Y/N) Samples Intact: (Y/N)
--	--	--	--------------	--

**Sample Condition Upon Receipt - ESI Tech Specs** Client Name: CH2M Hill Project #: **WO# : 10390962**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7222 2739 9098

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: FB Temp Blank?  Yes  No  
 Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.7 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 40.1 Date and Initials of Person Examining Contents: R66/3/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	Yes	No	N/A	COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3.
Sampler Name and/or Signature on COC? <u>R66/3/17</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		6.
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		8.
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9.
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>				
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Sample # <u>313</u> <u>3/3</u> <u>3/3</u> Just VOA JDD 6-3-17
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	14. <u>BSK Needs Head space</u>
3 Trip Blanks Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):				

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>11:20</u>	Temp: <u>3.6</u>	Corrected Temp: <u>3.7</u>
Time: <u>11:44</u>	put in cooler	
Time:	Temp:	Corrected Temp:

Project Manager Review: JENNI GROSS Date: 06/05/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 15, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

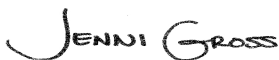
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390963

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10390963001	Silva-GW-060117	Water	06/01/17 10:00	06/03/17 09:15
10390963002	Trip Blank-060117	Water	06/01/17 08:00	06/03/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10390963001	Silva-GW-060117	EPA 8260B	DJB	83	PASI-M
10390963002	Trip Blank-060117	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10390963001</b>	<b>Silva-GW-060117</b>					
EPA 8260B	Acetone	11.4J	ug/L	20.0	06/14/17 14:23	L3
<b>10390963002</b>	<b>Trip Blank-060117</b>					
EPA 8260B	Methylene Chloride	0.48J	ug/L	4.0	06/14/17 12:34	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 479522

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2611900)
- Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2611900)
- Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479522

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390962001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2611901)
- Acetone
- Tetrahydrofuran
- MSD (Lab ID: 2611902)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 15, 2017

QC Batch: 479522

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390962001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- Acetone
- Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

Sample: **Silva-GW-060117** Lab ID: **10390963001** Collected: 06/01/17 10:00 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 14:23	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/14/17 14:23	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 14:23	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 14:23	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/14/17 14:23	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 14:23	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/14/17 14:23	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/14/17 14:23	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/14/17 14:23	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/14/17 14:23	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/14/17 14:23	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/14/17 14:23	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/14/17 14:23	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/14/17 14:23	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/14/17 14:23	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/14/17 14:23	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/14/17 14:23	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/14/17 14:23	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/14/17 14:23	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/14/17 14:23	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/14/17 14:23	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/14/17 14:23	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/14/17 14:23	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/14/17 14:23	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/14/17 14:23	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/14/17 14:23	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/14/17 14:23	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/14/17 14:23	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/14/17 14:23	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/14/17 14:23	108-10-1	
Acetone	11.4J	ug/L	20.0	0.64	1		06/14/17 14:23	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/14/17 14:23	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/14/17 14:23	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/14/17 14:23	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/14/17 14:23	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/14/17 14:23	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/14/17 14:23	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/14/17 14:23	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/14/17 14:23	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/14/17 14:23	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/14/17 14:23	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/14/17 14:23	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/14/17 14:23	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/14/17 14:23	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/14/17 14:23	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/14/17 14:23	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

Sample: **Silva-GW-060117** Lab ID: **10390963001** Collected: 06/01/17 10:00 Received: 06/03/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/14/17 14:23	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/14/17 14:23	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/14/17 14:23	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/14/17 14:23	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/14/17 14:23	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/14/17 14:23	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/14/17 14:23	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/14/17 14:23	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/14/17 14:23	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/14/17 14:23	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/14/17 14:23	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/14/17 14:23	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/14/17 14:23	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/14/17 14:23	109-99-9	
Toluene	<0.059	ug/L	1.0	0.059	1		06/14/17 14:23	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/14/17 14:23	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/14/17 14:23	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/14/17 14:23	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/14/17 14:23	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/14/17 14:23	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/14/17 14:23	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/14/17 14:23	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/14/17 14:23	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/14/17 14:23	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/14/17 14:23	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/14/17 14:23	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/14/17 14:23	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/14/17 14:23	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/14/17 14:23	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/14/17 14:23	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/14/17 14:23	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/14/17 14:23	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/14/17 14:23	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/14/17 14:23	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	95	%	75-137		1		06/14/17 14:23	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		06/14/17 14:23	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/14/17 14:23	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

**Sample: Trip Blank-060117**      **Lab ID: 10390963002**      Collected: 06/01/17 08:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 12:34	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/14/17 12:34	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 12:34	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/14/17 12:34	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/14/17 12:34	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/14/17 12:34	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/14/17 12:34	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/14/17 12:34	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/14/17 12:34	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/14/17 12:34	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/14/17 12:34	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/14/17 12:34	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/14/17 12:34	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/14/17 12:34	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/14/17 12:34	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/14/17 12:34	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/14/17 12:34	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/14/17 12:34	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/14/17 12:34	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/14/17 12:34	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/14/17 12:34	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/14/17 12:34	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/14/17 12:34	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/14/17 12:34	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/14/17 12:34	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/14/17 12:34	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/14/17 12:34	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/14/17 12:34	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/14/17 12:34	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/14/17 12:34	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/14/17 12:34	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/14/17 12:34	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/14/17 12:34	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/14/17 12:34	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/14/17 12:34	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/14/17 12:34	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/14/17 12:34	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/14/17 12:34	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/14/17 12:34	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/14/17 12:34	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/14/17 12:34	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/14/17 12:34	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/14/17 12:34	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/14/17 12:34	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/14/17 12:34	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/14/17 12:34	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

**Sample: Trip Blank-060117**      **Lab ID: 10390963002**      Collected: 06/01/17 08:00      Received: 06/03/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/14/17 12:34	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/14/17 12:34	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/14/17 12:34	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/14/17 12:34	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/14/17 12:34	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/14/17 12:34	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/14/17 12:34	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/14/17 12:34	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/14/17 12:34	1634-04-4	
Methylene Chloride	0.48J	ug/L	4.0	0.097	1		06/14/17 12:34	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/14/17 12:34	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/14/17 12:34	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/14/17 12:34	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/14/17 12:34	109-99-9	
Toluene	<0.059	ug/L	1.0	0.059	1		06/14/17 12:34	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/14/17 12:34	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/14/17 12:34	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/14/17 12:34	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/14/17 12:34	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/14/17 12:34	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/14/17 12:34	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/14/17 12:34	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/14/17 12:34	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/14/17 12:34	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/14/17 12:34	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/14/17 12:34	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/14/17 12:34	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/14/17 12:34	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/14/17 12:34	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/14/17 12:34	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/14/17 12:34	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/14/17 12:34	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/14/17 12:34	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/14/17 12:34	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	96	%	75-137		1		06/14/17 12:34	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/14/17 12:34	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/14/17 12:34	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390963

QC Batch: 479522 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10390963001, 10390963002

METHOD BLANK: 2611899 Matrix: Water  
Associated Lab Samples: 10390963001, 10390963002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/14/17 11:50	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/14/17 11:50	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/14/17 11:50	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/14/17 11:50	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/14/17 11:50	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/14/17 11:50	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/14/17 11:50	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/14/17 11:50	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/14/17 11:50	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/14/17 11:50	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/14/17 11:50	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/14/17 11:50	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/14/17 11:50	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/14/17 11:50	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/14/17 11:50	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/14/17 11:50	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/14/17 11:50	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/14/17 11:50	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/14/17 11:50	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/14/17 11:50	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/14/17 11:50	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/14/17 11:50	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/14/17 11:50	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/14/17 11:50	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/14/17 11:50	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/14/17 11:50	
Acetone	ug/L	<0.64	20.0	0.64	06/14/17 11:50	
Acrolein	ug/L	<2.1	10.0	2.1	06/14/17 11:50	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/14/17 11:50	
Benzene	ug/L	<0.042	0.50	0.042	06/14/17 11:50	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/14/17 11:50	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/14/17 11:50	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/14/17 11:50	
Bromoform	ug/L	<0.11	4.0	0.11	06/14/17 11:50	
Bromomethane	ug/L	<0.20	4.0	0.20	06/14/17 11:50	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/14/17 11:50	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/14/17 11:50	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

METHOD BLANK: 2611899

Matrix: Water

Associated Lab Samples: 10390963001, 10390963002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/14/17 11:50	
Chloroethane	ug/L	<0.12	1.0	0.12	06/14/17 11:50	
Chloroform	ug/L	<0.21	1.0	0.21	06/14/17 11:50	
Chloromethane	ug/L	<0.080	4.0	0.080	06/14/17 11:50	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/14/17 11:50	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/14/17 11:50	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/14/17 11:50	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/14/17 11:50	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/14/17 11:50	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/14/17 11:50	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/14/17 11:50	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/14/17 11:50	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/14/17 11:50	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/14/17 11:50	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/14/17 11:50	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/14/17 11:50	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/14/17 11:50	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/14/17 11:50	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/14/17 11:50	
Naphthalene	ug/L	<0.064	1.0	0.064	06/14/17 11:50	
o-Xylene	ug/L	<0.044	0.50	0.044	06/14/17 11:50	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/14/17 11:50	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/14/17 11:50	
Styrene	ug/L	<0.056	0.50	0.056	06/14/17 11:50	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/14/17 11:50	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/14/17 11:50	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/14/17 11:50	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/14/17 11:50	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/14/17 11:50	
Toluene	ug/L	<0.059	1.0	0.059	06/14/17 11:50	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/14/17 11:50	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/14/17 11:50	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/14/17 11:50	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/14/17 11:50	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/14/17 11:50	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/14/17 11:50	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/14/17 11:50	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/14/17 11:50	
1,2-Dichloroethane-d4 (S)	%	96	75-137		06/14/17 11:50	
4-Bromofluorobenzene (S)	%	102	75-125		06/14/17 11:50	
Toluene-d8 (S)	%	96	75-125		06/14/17 11:50	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

LABORATORY CONTROL SAMPLE: 2611900

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	109	75-136	
1,1,1-Trichloroethane	ug/L	20	21.0	105	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.6	103	71-138	
1,1,2-Trichloroethane	ug/L	20	20.1	100	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.4	107	69-126	
1,1-Dichloroethane	ug/L	20	20.8	104	75-125	
1,1-Dichloroethene	ug/L	20	21.2	106	75-125	
1,1-Dichloropropene	ug/L	20	22.0	110	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	75-125	
1,2,3-Trichloropropane	ug/L	20	21.4	107	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.0	105	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.0	106	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.9	110	75-125	
1,2-Dichlorobenzene	ug/L	20	21.5	107	75-125	
1,2-Dichloroethane	ug/L	20	20.3	102	70-125	
1,2-Dichloroethene (Total)	ug/L	40	42.2	106	75-125	
1,2-Dichloropropane	ug/L	20	21.1	106	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	22.2	111	75-125	
1,4-Dichlorobenzene	ug/L	20	20.0	100	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	380	95	64-140	
2,2,4-Trimethylpentane	ug/L	20	22.0	110	68-125	
2,2-Dichloropropane	ug/L	20	22.8	114	70-131	
2-Butanone (MEK)	ug/L	100	108	108	69-125	
2-Chlorotoluene	ug/L	20	20.5	103	75-125	
2-Hexanone	ug/L	100	115	115	73-129	
4-Chlorotoluene	ug/L	20	21.0	105	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	73-125	
Acetone	ug/L	100	129	129	66-126 L1	
Acrolein	ug/L	200	230	115	56-150	
Acrylonitrile	ug/L	200	218	109	68-129	
Benzene	ug/L	20	20.4	102	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	22.4	112	75-126	
Bromodichloromethane	ug/L	20	21.3	106	75-133	
Bromoform	ug/L	20	20.6	103	62-142	
Bromomethane	ug/L	20	17.8	89	34-143	
Carbon disulfide	ug/L	20	20.7	103	71-125	
Carbon tetrachloride	ug/L	20	22.7	114	71-145	
Chlorobenzene	ug/L	20	20.5	102	75-125	
Chloroethane	ug/L	20	21.3	107	75-125	
Chloroform	ug/L	20	20.4	102	75-125	
Chloromethane	ug/L	20	20.3	102	54-125	
cis-1,2-Dichloroethene	ug/L	20	21.3	107	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.5	103	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390963

LABORATORY CONTROL SAMPLE: 2611900

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.0	105	74-141	
Dibromomethane	ug/L	20	23.0	115	75-125	
Dichlorodifluoromethane	ug/L	20	19.8	99	59-130	
Dichlorofluoromethane	ug/L	20	21.3	106	75-125	
Diisopropyl ether	ug/L	20	21.1	105	69-125	
Ethyl-tert-butyl ether	ug/L	20	22.4	112	73-125	
Ethylbenzene	ug/L	20	19.8	99	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.9	114	75-131	
Isopropylbenzene (Cumene)	ug/L	20	21.4	107	75-125	
m&p-Xylene	ug/L	40	42.5	106	75-125	
Methyl-tert-butyl ether	ug/L	20	22.2	111	75-125	
Methylene Chloride	ug/L	20	19.8	99	73-125	
n-Butylbenzene	ug/L	20	21.4	107	75-125	
n-Propylbenzene	ug/L	20	19.8	99	75-125	
Naphthalene	ug/L	20	19.3	96	74-125	
o-Xylene	ug/L	20	22.1	111	75-125	
p-Isopropyltoluene	ug/L	20	19.8	99	75-125	
sec-Butylbenzene	ug/L	20	21.2	106	75-125	
Styrene	ug/L	20	20.2	101	75-125	
tert-Amylmethyl ether	ug/L	20	21.9	110	71-126	
tert-Butyl Alcohol	ug/L	200	197	99	69-131	
tert-Butylbenzene	ug/L	20	20.7	103	75-125	
Tetrachloroethene	ug/L	20	20.6	103	75-125	
Tetrahydrofuran	ug/L	200	256	128	65-127 L3	
Toluene	ug/L	20	18.3	91	75-125	
trans-1,2-Dichloroethene	ug/L	20	20.9	105	75-125	
trans-1,3-Dichloropropene	ug/L	20	21.2	106	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	51.0	102	30-150	
Trichloroethene	ug/L	20	20.3	102	75-125	
Trichlorofluoromethane	ug/L	20	21.9	110	71-140	
Vinyl acetate	ug/L	20	22.2	111	68-137	
Vinyl chloride	ug/L	20	21.7	108	70-125	
Xylene (Total)	ug/L	60	64.7	108	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611901 2611902

Parameter	Units	2611901		2611902		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	20.7	22.4	104	112	75-137	8	30
1,1,1-Trichloroethane	ug/L	<0.057	20	20	21.2	23.2	106	116	75-139	9	30
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	18.2	20.1	91	100	60-142	10	30
1,1,2-Trichloroethane	ug/L	<0.064	20	20	17.9	19.2	90	96	75-128	7	30

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390963

Parameter	Units	10390962001		2611901		2611902		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	24.6	27.1	123	136	62-150	10	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	20.2	22.0	101	110	70-129	9	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	21.5	23.6	108	118	67-141	9	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	22.5	24.3	113	121	64-144	7	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	19.5	21.3	97	107	66-139	9	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.0	20.5	95	103	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	20.7	22.4	103	112	65-138	8	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	18.9	20.6	94	103	65-143	9	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	45.9	51.1	92	102	61-134	11	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	19.7	21.7	98	108	74-129	10	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	19.7	21.8	99	109	68-135	10	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	18.7	19.8	93	99	73-125	6	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	41.9	44.9	105	112	69-134	7	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	19.8	21.5	99	108	64-130	8	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	20.5	22.2	103	111	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	19.4	21.2	97	106	69-135	9	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.7	21.5	99	108	67-128	9	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	19.0	20.7	95	104	66-134	9	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	385	411	96	103	58-140	7	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	27.1	28.9	135	144	48-150	6	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	22.9	24.7	114	123	50-150	7	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	86.9	95.1	87	95	58-125	9	30		
2-Chlorotoluene	ug/L	<0.084	20	20	19.8	21.5	99	108	65-138	8	30		
2-Hexanone	ug/L	<0.19	100	100	95.5	105	96	105	61-134	9	30		
4-Chlorotoluene	ug/L	<0.048	20	20	20.1	21.8	100	109	68-135	8	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	92.5	103	92	103	61-130	11	30		
Acetone	ug/L	<0.64	100	100	160	171	160	171	51-140	7	30	M0	
Acrolein	ug/L	<2.1	200	200	245	270	123	135	48-150	10	30		
Acrylonitrile	ug/L	<0.49	200	200	185	203	93	102	55-134	9	30		
Benzene	ug/L	<0.042	20	20	19.7	21.4	98	107	63-132	8	30		
Bromobenzene	ug/L	<0.087	20	20	19.2	20.9	96	104	67-138	8	30		
Bromochloromethane	ug/L	<0.082	20	20	20.5	21.6	103	108	66-138	5	30		
Bromodichloromethane	ug/L	<0.068	20	20	19.7	21.2	99	106	75-137	7	30		
Bromoform	ug/L	<0.11	20	20	18.8	20.4	94	102	65-129	8	30		
Bromomethane	ug/L	<0.20	20	20	20.9	23.1	105	116	41-150	10	30		
Carbon disulfide	ug/L	<0.20	20	20	21.6	23.2	108	116	72-132	7	30		
Carbon tetrachloride	ug/L	<0.079	20	20	23.8	25.8	119	129	75-150	8	30		
Chlorobenzene	ug/L	<0.066	20	20	19.5	21.1	97	105	73-127	8	30		
Chloroethane	ug/L	<0.12	20	20	22.1	22.8	111	114	74-138	3	30		
Chloroform	ug/L	<0.21	20	20	19.5	21.5	98	107	74-125	9	30		
Chloromethane	ug/L	<0.080	20	20	21.5	21.5	108	108	58-129	0	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	21.0	22.3	105	111	63-135	6	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.0	20.5	95	102	66-129	7	30		
Dibromochloromethane	ug/L	<0.048	20	20	18.8	20.7	94	103	75-133	10	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390963

Parameter	Units	10390962001		2611901		2611902		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<0.14	20	20	21.0	22.9	105	114	68-134	9	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	23.4	24.0	117	120	72-150	3	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	21.9	22.6	109	113	75-129	3	30		
Diisopropyl ether	ug/L	<0.050	20	20	19.4	20.8	97	104	62-128	7	30		
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	20.3	22.0	101	110	63-132	8	30		
Ethylbenzene	ug/L	<0.075	20	20	19.4	21.2	97	106	72-130	9	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	25.8	27.8	129	139	71-150	8	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	21.1	23.2	105	116	70-136	10	30		
m&p-Xylene	ug/L	<0.11	40	40	41.5	45.0	104	113	64-142	8	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.7	21.2	98	106	72-125	8	30		
Methylene Chloride	ug/L	<0.097	20	20	18.5	19.8	92	99	60-132	7	30		
n-Butylbenzene	ug/L	<0.16	20	20	22.5	24.0	112	120	60-150	6	30		
n-Propylbenzene	ug/L	<0.049	20	20	20.0	21.8	100	109	63-142	9	30		
Naphthalene	ug/L	<0.064	20	20	18.0	20.0	90	100	67-125	11	30		
o-Xylene	ug/L	<0.044	20	20	21.2	22.5	106	113	60-143	6	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	20.4	21.9	102	109	64-146	7	30		
sec-Butylbenzene	ug/L	<0.094	20	20	22.0	23.7	110	119	67-144	8	30		
Styrene	ug/L	<0.056	20	20	19.0	20.5	95	102	67-136	8	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	19.3	20.8	97	104	60-134	7	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	198	214	99	107	56-146	8	30		
tert-Butylbenzene	ug/L	<0.051	20	20	20.9	23.1	105	116	68-135	10	30		
Tetrachloroethene	ug/L	<0.13	20	20	20.7	22.9	103	115	67-148	10	30		
Tetrahydrofuran	ug/L	<1.5	200	200	352	391	176	196	51-141	11	30	MO	
Toluene	ug/L	0.065J	20	20	18.1	19.5	90	97	61-140	7	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	20.9	22.7	105	113	62-138	8	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	19.5	21.2	98	106	67-134	8	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	44.6	49.3	89	99	30-150	10	30		
Trichloroethene	ug/L	<0.044	20	20	19.9	22.0	100	110	64-149	10	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	24.6	25.4	123	127	75-150	3	30		
Vinyl acetate	ug/L	<0.12	20	20	19.5	21.5	97	108	49-143	10	30		
Vinyl chloride	ug/L	<0.098	20	20	23.3	24.1	117	120	75-133	3	30		
Xylene (Total)	ug/L	<0.15	60	60	62.8	67.6	105	113	63-142	7	30		
1,2-Dichloroethane-d4 (S)	%						94	94	75-137				
4-Bromofluorobenzene (S)	%						101	101	75-125				
Toluene-d8 (S)	%						99	99	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10390963

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

- L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
- L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.
- M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10390963

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10390963001	Silva-GW-060117	EPA 8260B	479522		
10390963002	Trip Blank-060117	EPA 8260B	479522		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10390963

### Section A Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2n.com  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day

### Section B Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #:  
 Project Name: UPRR Freeman  
 Project #: 1497

### Section C Invoice Information:

Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: CAS  
 Pace Quote:  
 Pace Project Manager:  
 Pace Profile #: 36447 / 4

Page : \_\_\_\_\_ Of \_\_\_\_\_

Regulatory Agency: \_\_\_\_\_  
 State / Location: \_\_\_\_\_  
 WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -)!! Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analyses Test	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)									
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other		Low Level VOCs by 8260	6010/7470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	BOD 10360W	COD 410.4		CSIA of CTET (8260 Must be analyzed)								
				DATE	TIME	DATE	TIME																															
1	Silva-GW-060117	WTG			6-17	10:00		3																														601
2	Trip Blank-060117	WTG			6-17	08:00		1																												Trip Blank 002		
3																																						
4																																						
5																																						
6																																						
7																																						
8																																						
9																																						
10																																						
11																																						
12																																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	<i>[Signature]</i>	6-27-17	15:00	<i>[Signature]</i> Pace	6/3/17	9:15	3.7 Y Y Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice: (Y/N)	Custody Sealed: (Y/N)	Cooler: (Y/N)	Samples Intact: (Y/N)
PRINT Name of SAMPLER:	SIGNATURE of SAMPLER:					
	DATE Signed:					

Sample Condition  
 Upon Receipt - ESI  
 Tech Specs

Client Name: CH2MHill

Project #:

WO#: **10390963**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other:  
 Tracking Number: 7222 2739 9098

Custody Seal on Cooler/Box Present?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: FB  
 Thermometer Used:  151401163  151401164  
 Type of Ice:  Wet  Blue  None  
 Temp Blank?  Yes  No  
 Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.7  
 Temp should be above freezing to 6°C  
 Correction Factor: 10.1 Date and Initials of Person Examining Contents: R66/3/17  
 Biological Tissue Frozen?  Yes  No  NA

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

			COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>R66/3/17</u>	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		12.
-Includes Date/Time/ID/Analysis Matrix:	<u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Sample # <u>1</u>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Initial when completed: <u>1</u> Lot # of added preservative: <u>JDD 6-3-17</u>
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		14. <u>RSX Needs Head space</u>
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):	<u>109137</u>		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>11:20</u>	Temp: <u>3.6</u>	Corrected Temp: <u>3.7</u>
Time: <u>11:44</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_

JENNI GROSS

Date: 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 16, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

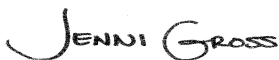
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 02, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391003001	MW 12S-GW-053117	Water	05/31/17 09:05	06/02/17 09:45
10391003002	MW 11S-GW-053117	Water	05/31/17 10:10	06/02/17 09:45
10391003003	MW 10S-GW-053117	Water	05/31/17 11:10	06/02/17 09:45
10391003004	MW 13S-GW-053117	Water	05/31/17 12:15	06/02/17 09:45
10391003005	MW 7S-GW-053117	Water	05/31/17 13:10	06/02/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391003001	MW 12S-GW-053117	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391003002	MW 11S-GW-053117	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391003003	MW 10S-GW-053117	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391003004	MW 13S-GW-053117	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391003005	MW 7S-GW-053117	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10391003001</b>	<b>MW 12S-GW-053117</b>					
RSK 175	Ethene	0.80J	ug/L	10.0	06/07/17 10:29	
6010C Met	Aluminum, Dissolved	134J	ug/L	200	06/09/17 09:41	
6010C Met	Barium, Dissolved	206	ug/L	10.0	06/09/17 09:41	
6010C Met	Cadmium, Dissolved	3.6	ug/L	3.0	06/09/17 09:41	
6010C Met	Calcium, Dissolved	84200	ug/L	500	06/09/17 09:41	
6010C Met	Cobalt, Dissolved	2.6J	ug/L	10.0	06/09/17 09:41	
6010C Met	Copper, Dissolved	1.4J	ug/L	10.0	06/09/17 09:41	
6010C Met	Iron, Dissolved	121	ug/L	50.0	06/09/17 09:41	
6010C Met	Lead, Dissolved	3.2J	ug/L	10.0	06/09/17 09:41	
6010C Met	Magnesium, Dissolved	24500	ug/L	500	06/09/17 09:41	
6010C Met	Manganese, Dissolved	376	ug/L	5.0	06/09/17 09:41	
6010C Met	Nickel, Dissolved	6.4J	ug/L	20.0	06/09/17 09:41	
6010C Met	Potassium, Dissolved	827J	ug/L	2500	06/09/17 09:41	
6010C Met	Sodium, Dissolved	37200	ug/L	1000	06/09/17 09:41	
6010C Met	Thallium, Dissolved	5.6J	ug/L	20.0	06/09/17 09:41	
6010C Met	Vanadium, Dissolved	3.3J	ug/L	15.0	06/09/17 09:41	
6010C Met	Zinc, Dissolved	25.6	ug/L	20.0	06/09/17 09:41	
SM 2320B	Alkalinity, Total as CaCO3	256	mg/L	5.0	06/10/17 12:33	
SM 2540C	Total Dissolved Solids	504	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	45.8	mg/L	1.2	06/09/17 00:39	
EPA 300.0	Nitrate as N	5.9	mg/L	0.10	06/09/17 00:39	H3
EPA 300.0	Sulfate	39.7	mg/L	1.2	06/09/17 00:39	
EPA 353.2	Nitrogen, NO2 plus NO3	6.2	mg/L	0.10	06/08/17 14:08	FS
EPA 410.4	Chemical Oxygen Demand	34.9J	mg/L	50.0	06/15/17 08:25	
SM 5310C	Total Organic Carbon	3.3	mg/L	1.0	06/07/17 16:24	
<b>10391003002</b>	<b>MW 11S-GW-053117</b>					
RSK 175	Methane	2.6J	ug/L	10.0	06/07/17 10:44	
6010C Met	Aluminum, Dissolved	32.4J	ug/L	200	06/09/17 09:44	
6010C Met	Barium, Dissolved	66.1	ug/L	10.0	06/09/17 09:44	
6010C Met	Cadmium, Dissolved	0.82J	ug/L	3.0	06/09/17 09:44	
6010C Met	Calcium, Dissolved	46100	ug/L	500	06/09/17 09:44	
6010C Met	Chromium, Dissolved	2.4J	ug/L	10.0	06/09/17 09:44	
6010C Met	Cobalt, Dissolved	1.7J	ug/L	10.0	06/09/17 09:44	
6010C Met	Copper, Dissolved	1.0J	ug/L	10.0	06/09/17 09:44	
6010C Met	Iron, Dissolved	63.3	ug/L	50.0	06/09/17 09:44	
6010C Met	Lead, Dissolved	1.9J	ug/L	10.0	06/09/17 09:44	
6010C Met	Magnesium, Dissolved	13400	ug/L	500	06/09/17 09:44	
6010C Met	Manganese, Dissolved	250	ug/L	5.0	06/09/17 09:44	
6010C Met	Nickel, Dissolved	2.2J	ug/L	20.0	06/09/17 09:44	
6010C Met	Potassium, Dissolved	794J	ug/L	2500	06/09/17 09:44	
6010C Met	Sodium, Dissolved	19800	ug/L	1000	06/09/17 09:44	
6010C Met	Thallium, Dissolved	5.2J	ug/L	20.0	06/09/17 09:44	
6010C Met	Vanadium, Dissolved	6.1J	ug/L	15.0	06/09/17 09:44	
6010C Met	Zinc, Dissolved	14.6J	ug/L	20.0	06/09/17 09:44	
SM 2320B	Alkalinity, Total as CaCO3	204	mg/L	5.0	06/10/17 12:36	
SM 2540C	Total Dissolved Solids	273	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	1.6	mg/L	1.2	06/09/17 00:54	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10391003002</b>	<b>MW 11S-GW-053117</b>					
EPA 300.0	Nitrate as N	0.047J	mg/L	0.10	06/09/17 00:54	H3
EPA 300.0	Sulfate	2.9	mg/L	1.2	06/09/17 00:54	
EPA 353.2	Nitrogen, NO2 plus NO3	0.076	mg/L	0.020	06/08/17 13:54	FS
EPA 410.4	Chemical Oxygen Demand	18.8J	mg/L	50.0	06/15/17 08:26	
SM 5310C	Total Organic Carbon	0.77J	mg/L	1.0	06/07/17 16:37	
<b>10391003003</b>	<b>MW 10S-GW-053117</b>					
RSK 175	Methane	20.1	ug/L	10.0	06/07/17 10:51	
6010C Met	Aluminum, Dissolved	16.3J	ug/L	200	06/09/17 09:47	
6010C Met	Barium, Dissolved	71.7	ug/L	10.0	06/09/17 09:47	
6010C Met	Cadmium, Dissolved	0.33J	ug/L	3.0	06/09/17 09:47	
6010C Met	Calcium, Dissolved	75000	ug/L	500	06/09/17 09:47	
6010C Met	Cobalt, Dissolved	0.78J	ug/L	10.0	06/09/17 09:47	
6010C Met	Copper, Dissolved	1.1J	ug/L	10.0	06/09/17 09:47	
6010C Met	Iron, Dissolved	33.1J	ug/L	50.0	06/09/17 09:47	
6010C Met	Lead, Dissolved	2.9J	ug/L	10.0	06/09/17 09:47	
6010C Met	Magnesium, Dissolved	21200	ug/L	500	06/09/17 09:47	
6010C Met	Manganese, Dissolved	80.8	ug/L	5.0	06/09/17 09:47	
6010C Met	Potassium, Dissolved	744J	ug/L	2500	06/09/17 09:47	
6010C Met	Sodium, Dissolved	13100	ug/L	1000	06/09/17 09:47	
6010C Met	Thallium, Dissolved	5.5J	ug/L	20.0	06/09/17 09:47	
6010C Met	Vanadium, Dissolved	4.1J	ug/L	15.0	06/09/17 09:47	
6010C Met	Zinc, Dissolved	9.9J	ug/L	20.0	06/09/17 09:47	
EPA 7470A	Mercury, Dissolved	0.15J	ug/L	0.20	06/12/17 14:41	
SM 2320B	Alkalinity, Total as CaCO3	283	mg/L	5.0	06/10/17 14:04	
SM 2540C	Total Dissolved Solids	345	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	1.4	mg/L	1.2	06/09/17 01:09	
EPA 300.0	Nitrate as N	0.33	mg/L	0.10	06/09/17 01:09	H3
EPA 300.0	Sulfate	2.6	mg/L	1.2	06/09/17 01:09	
EPA 353.2	Nitrogen, NO2 plus NO3	0.43	mg/L	0.020	06/08/17 13:55	
SM 5310C	Total Organic Carbon	1.1	mg/L	1.0	06/07/17 16:50	
<b>10391003004</b>	<b>MW 13S-GW-053117</b>					
RSK 175	Methane	2.6J	ug/L	10.0	06/07/17 10:58	
6010C Met	Aluminum, Dissolved	22.9J	ug/L	200	06/09/17 09:50	
6010C Met	Barium, Dissolved	70.5	ug/L	10.0	06/09/17 09:50	
6010C Met	Cadmium, Dissolved	1.2J	ug/L	3.0	06/09/17 09:50	
6010C Met	Calcium, Dissolved	38900	ug/L	500	06/09/17 09:50	
6010C Met	Cobalt, Dissolved	0.57J	ug/L	10.0	06/09/17 09:50	
6010C Met	Iron, Dissolved	34.0J	ug/L	50.0	06/09/17 09:50	
6010C Met	Magnesium, Dissolved	11600	ug/L	500	06/09/17 09:50	
6010C Met	Manganese, Dissolved	23.3	ug/L	5.0	06/09/17 09:50	
6010C Met	Potassium, Dissolved	1260J	ug/L	2500	06/09/17 09:50	
6010C Met	Sodium, Dissolved	15400	ug/L	1000	06/09/17 09:50	
6010C Met	Thallium, Dissolved	3.9J	ug/L	20.0	06/09/17 09:50	
6010C Met	Vanadium, Dissolved	9.9J	ug/L	15.0	06/09/17 09:50	
6010C Met	Zinc, Dissolved	28.4	ug/L	20.0	06/09/17 09:50	
EPA 7470A	Mercury, Dissolved	1.5	ug/L	0.20	06/12/17 14:43	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391003004</b>	<b>MW 13S-GW-053117</b>					
SM 2320B	Alkalinity, Total as CaCO3	174	mg/L	5.0	06/10/17 14:07	
SM 2540C	Total Dissolved Solids	239	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	1.5	mg/L	1.2	06/09/17 01:24	
EPA 300.0	Nitrate as N	0.20	mg/L	0.10	06/09/17 01:24	H3
EPA 300.0	Sulfate	4.2	mg/L	1.2	06/09/17 01:24	
EPA 353.2	Nitrogen, NO2 plus NO3	0.23	mg/L	0.020	06/08/17 13:56	
SM 5310C	Total Organic Carbon	0.74J	mg/L	1.0	06/07/17 17:29	
<b>10391003005</b>	<b>MW 7S-GW-053117</b>					
RSK 175	Methane	1.6J	ug/L	10.0	06/07/17 11:05	
6010C Met	Barium, Dissolved	31.8	ug/L	10.0	06/09/17 09:59	
6010C Met	Calcium, Dissolved	39900	ug/L	500	06/09/17 09:59	
6010C Met	Iron, Dissolved	30.4J	ug/L	50.0	06/09/17 09:59	
6010C Met	Lead, Dissolved	2.4J	ug/L	10.0	06/09/17 09:59	
6010C Met	Magnesium, Dissolved	10400	ug/L	500	06/09/17 09:59	
6010C Met	Manganese, Dissolved	13.8	ug/L	5.0	06/09/17 09:59	
6010C Met	Potassium, Dissolved	630J	ug/L	2500	06/09/17 09:59	
6010C Met	Sodium, Dissolved	11600	ug/L	1000	06/09/17 09:59	
6010C Met	Vanadium, Dissolved	1.8J	ug/L	15.0	06/09/17 09:59	
6010C Met	Zinc, Dissolved	16.3J	ug/L	20.0	06/09/17 09:59	
SM 2320B	Alkalinity, Total as CaCO3	98.3	mg/L	5.0	06/10/17 14:12	
SM 2540C	Total Dissolved Solids	258	mg/L	10.0	06/06/17 15:39	
EPA 300.0	Chloride	10.9	mg/L	1.2	06/09/17 01:39	
EPA 300.0	Nitrate as N	7.8	mg/L	0.10	06/09/17 01:39	H3
EPA 300.0	Sulfate	21.7	mg/L	1.2	06/09/17 01:39	
EPA 353.2	Nitrogen, NO2 plus NO3	8.3	mg/L	0.20	06/09/17 15:08	
SM 5310C	Total Organic Carbon	0.67J	mg/L	1.0	06/07/17 17:42	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479008

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390828002,10390917001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2609779)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2609780)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

### General Information:

5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.

- MW 10S-GW-053117 (Lab ID: 10391003003)
- MW 11S-GW-053117 (Lab ID: 10391003002)
- MW 12S-GW-053117 (Lab ID: 10391003001)
- MW 13S-GW-053117 (Lab ID: 10391003004)
- MW 7S-GW-053117 (Lab ID: 10391003005)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 478631

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10390555001,10391583001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2607473)
  - Nitrogen, NO2 plus NO3
- MS (Lab ID: 2607475)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2607474)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2607476)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 16, 2017

**General Information:**

5 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

**Sample: MW 12S-GW-053117**      **Lab ID: 10391003001**      Collected: 05/31/17 09:05      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 10:29	74-84-0	
Ethene	<b>0.80J</b>	ug/L	10.0	0.68	1		06/07/17 10:29	74-85-1	
Methane	<1.1	ug/L	10.0	1.1	1		06/07/17 10:29	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<b>134J</b>	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 09:41	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:41	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:41	7440-38-2	
Barium, Dissolved	<b>206</b>	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 09:41	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 09:41	7440-41-7	
Cadmium, Dissolved	<b>3.6</b>	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 09:41	7440-43-9	
Calcium, Dissolved	<b>84200</b>	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 09:41	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 09:41	7440-47-3	
Cobalt, Dissolved	<b>2.6J</b>	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 09:41	7440-48-4	
Copper, Dissolved	<b>1.4J</b>	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 09:41	7440-50-8	
Iron, Dissolved	<b>121</b>	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 09:41	7439-89-6	
Lead, Dissolved	<b>3.2J</b>	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 09:41	7439-92-1	
Magnesium, Dissolved	<b>24500</b>	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 09:41	7439-95-4	
Manganese, Dissolved	<b>376</b>	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 09:41	7439-96-5	
Nickel, Dissolved	<b>6.4J</b>	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 09:41	7440-02-0	
Potassium, Dissolved	<b>827J</b>	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 09:41	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 09:41	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 09:41	7440-22-4	
Sodium, Dissolved	<b>37200</b>	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 09:41	7440-23-5	
Thallium, Dissolved	<b>5.6J</b>	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 09:41	7440-28-0	
Vanadium, Dissolved	<b>3.3J</b>	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 09:41	7440-62-2	
Zinc, Dissolved	<b>25.6</b>	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 09:41	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:36	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	<b>256</b>	mg/L	5.0	1.4	1		06/10/17 12:33		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	<b>504</b>	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:33	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	<b>45.8</b>	mg/L	1.2	0.10	1		06/09/17 00:39	16887-00-6	
Nitrate as N	<b>5.9</b>	mg/L	0.10	0.013	1		06/09/17 00:39	14797-55-8	H3
Sulfate	<b>39.7</b>	mg/L	1.2	0.16	1		06/09/17 00:39	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Sample: MW 12S-GW-053117**      **Lab ID: 10391003001**      Collected: 05/31/17 09:05      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>6.2</b>	mg/L	0.10	0.037	5		06/08/17 14:08		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>34.9J</b>	mg/L	50.0	15.8	1	06/14/17 16:18	06/15/17 08:25		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.3</b>	mg/L	1.0	0.20	1		06/07/17 16:24	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

**Sample: MW 11S-GW-053117**      **Lab ID: 10391003002**      Collected: 05/31/17 10:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 10:44	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 10:44	74-85-1	
Methane	2.6J	ug/L	10.0	1.1	1		06/07/17 10:44	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	32.4J	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 09:44	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:44	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:44	7440-38-2	
Barium, Dissolved	66.1	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 09:44	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 09:44	7440-41-7	
Cadmium, Dissolved	0.82J	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 09:44	7440-43-9	
Calcium, Dissolved	46100	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 09:44	7440-70-2	
Chromium, Dissolved	2.4J	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 09:44	7440-47-3	
Cobalt, Dissolved	1.7J	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 09:44	7440-48-4	
Copper, Dissolved	1.0J	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 09:44	7440-50-8	
Iron, Dissolved	63.3	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 09:44	7439-89-6	
Lead, Dissolved	1.9J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 09:44	7439-92-1	
Magnesium, Dissolved	13400	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 09:44	7439-95-4	
Manganese, Dissolved	250	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 09:44	7439-96-5	
Nickel, Dissolved	2.2J	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 09:44	7440-02-0	
Potassium, Dissolved	794J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 09:44	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 09:44	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 09:44	7440-22-4	
Sodium, Dissolved	19800	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 09:44	7440-23-5	
Thallium, Dissolved	5.2J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 09:44	7440-28-0	
Vanadium, Dissolved	6.1J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 09:44	7440-62-2	
Zinc, Dissolved	14.6J	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 09:44	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:38	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	204	mg/L	5.0	1.4	1		06/10/17 12:36		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	273	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:33	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.6	mg/L	1.2	0.10	1		06/09/17 00:54	16887-00-6	
Nitrate as N	0.047J	mg/L	0.10	0.013	1		06/09/17 00:54	14797-55-8	H3
Sulfate	2.9	mg/L	1.2	0.16	1		06/09/17 00:54	14808-79-8	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

**Sample: MW 11S-GW-053117**      **Lab ID: 10391003002**      Collected: 05/31/17 10:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.076</b>	mg/L	0.020	0.0075	1		06/08/17 13:54		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>18.8J</b>	mg/L	50.0	15.8	1	06/14/17 16:18	06/15/17 08:26		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.77J</b>	mg/L	1.0	0.20	1		06/07/17 16:37	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

**Sample: MW 10S-GW-053117**      **Lab ID: 10391003003**      Collected: 05/31/17 11:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 10:51	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 10:51	74-85-1	
Methane	20.1	ug/L	10.0	1.1	1		06/07/17 10:51	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	16.3J	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 09:47	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:47	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:47	7440-38-2	
Barium, Dissolved	71.7	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 09:47	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 09:47	7440-41-7	
Cadmium, Dissolved	0.33J	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 09:47	7440-43-9	
Calcium, Dissolved	75000	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 09:47	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 09:47	7440-47-3	
Cobalt, Dissolved	0.78J	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 09:47	7440-48-4	
Copper, Dissolved	1.1J	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 09:47	7440-50-8	
Iron, Dissolved	33.1J	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 09:47	7439-89-6	
Lead, Dissolved	2.9J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 09:47	7439-92-1	
Magnesium, Dissolved	21200	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 09:47	7439-95-4	
Manganese, Dissolved	80.8	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 09:47	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 09:47	7440-02-0	
Potassium, Dissolved	744J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 09:47	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 09:47	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 09:47	7440-22-4	
Sodium, Dissolved	13100	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 09:47	7440-23-5	
Thallium, Dissolved	5.5J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 09:47	7440-28-0	
Vanadium, Dissolved	4.1J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 09:47	7440-62-2	
Zinc, Dissolved	9.9J	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 09:47	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	0.15J	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:41	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	283	mg/L	5.0	1.4	1		06/10/17 14:04		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	345	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:33	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.4	mg/L	1.2	0.10	1		06/09/17 01:09	16887-00-6	
Nitrate as N	0.33	mg/L	0.10	0.013	1		06/09/17 01:09	14797-55-8	H3
Sulfate	2.6	mg/L	1.2	0.16	1		06/09/17 01:09	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Sample: MW 10S-GW-053117**      **Lab ID: 10391003003**      Collected: 05/31/17 11:10      Received: 06/02/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.43</b>	mg/L	0.020	0.0075	1		06/08/17 13:55		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 16:18	06/15/17 08:26		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>1.1</b>	mg/L	1.0	0.20	1		06/07/17 16:50	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

**Sample: MW 13S-GW-053117**      **Lab ID: 10391003004**      Collected: 05/31/17 12:15      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 10:58	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 10:58	74-85-1	
Methane	2.6J	ug/L	10.0	1.1	1		06/07/17 10:58	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	22.9J	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 09:50	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:50	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:50	7440-38-2	
Barium, Dissolved	70.5	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 09:50	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 09:50	7440-41-7	
Cadmium, Dissolved	1.2J	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 09:50	7440-43-9	
Calcium, Dissolved	38900	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 09:50	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 09:50	7440-47-3	
Cobalt, Dissolved	0.57J	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 09:50	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 09:50	7440-50-8	
Iron, Dissolved	34.0J	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 09:50	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 09:50	7439-92-1	
Magnesium, Dissolved	11600	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 09:50	7439-95-4	
Manganese, Dissolved	23.3	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 09:50	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 09:50	7440-02-0	
Potassium, Dissolved	1260J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 09:50	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 09:50	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 09:50	7440-22-4	
Sodium, Dissolved	15400	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 09:50	7440-23-5	
Thallium, Dissolved	3.9J	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 09:50	7440-28-0	
Vanadium, Dissolved	9.9J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 09:50	7440-62-2	
Zinc, Dissolved	28.4	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 09:50	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	1.5	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:43	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	174	mg/L	5.0	1.4	1		06/10/17 14:07		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	239	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:33	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.5	mg/L	1.2	0.10	1		06/09/17 01:24	16887-00-6	
Nitrate as N	0.20	mg/L	0.10	0.013	1		06/09/17 01:24	14797-55-8	H3
Sulfate	4.2	mg/L	1.2	0.16	1		06/09/17 01:24	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Sample: MW 13S-GW-053117**      **Lab ID: 10391003004**      Collected: 05/31/17 12:15      Received: 06/02/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.23</b>	mg/L	0.020	0.0075	1		06/08/17 13:56		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 16:18	06/15/17 08:26		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.74J</b>	mg/L	1.0	0.20	1		06/07/17 17:29	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

**Sample: MW 7S-GW-053117**      **Lab ID: 10391003005**      Collected: 05/31/17 13:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/07/17 11:05	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/07/17 11:05	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		06/07/17 11:05	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/08/17 08:17	06/09/17 09:59	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:59	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/08/17 08:17	06/09/17 09:59	7440-38-2	
Barium, Dissolved	31.8	ug/L	10.0	0.20	1	06/08/17 08:17	06/09/17 09:59	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/08/17 08:17	06/09/17 09:59	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/08/17 08:17	06/09/17 09:59	7440-43-9	
Calcium, Dissolved	39900	ug/L	500	15.8	1	06/08/17 08:17	06/09/17 09:59	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/08/17 08:17	06/09/17 09:59	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/08/17 08:17	06/09/17 09:59	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/08/17 08:17	06/09/17 09:59	7440-50-8	
Iron, Dissolved	30.4J	ug/L	50.0	18.0	1	06/08/17 08:17	06/09/17 09:59	7439-89-6	
Lead, Dissolved	2.4J	ug/L	10.0	1.9	1	06/08/17 08:17	06/09/17 09:59	7439-92-1	
Magnesium, Dissolved	10400	ug/L	500	7.4	1	06/08/17 08:17	06/09/17 09:59	7439-95-4	
Manganese, Dissolved	13.8	ug/L	5.0	0.33	1	06/08/17 08:17	06/09/17 09:59	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/08/17 08:17	06/09/17 09:59	7440-02-0	
Potassium, Dissolved	630J	ug/L	2500	26.1	1	06/08/17 08:17	06/09/17 09:59	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/08/17 08:17	06/09/17 09:59	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/08/17 08:17	06/09/17 09:59	7440-22-4	
Sodium, Dissolved	11600	ug/L	1000	12.0	1	06/08/17 08:17	06/09/17 09:59	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/08/17 08:17	06/09/17 09:59	7440-28-0	
Vanadium, Dissolved	1.8J	ug/L	15.0	0.39	1	06/08/17 08:17	06/09/17 09:59	7440-62-2	
Zinc, Dissolved	16.3J	ug/L	20.0	1.4	1	06/08/17 08:17	06/09/17 09:59	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/09/17 10:43	06/12/17 14:45	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	98.3	mg/L	5.0	1.4	1		06/10/17 14:12		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	258	mg/L	10.0	5.0	1		06/06/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/07/17 09:34	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	10.9	mg/L	1.2	0.10	1		06/09/17 01:39	16887-00-6	
Nitrate as N	7.8	mg/L	0.10	0.013	1		06/09/17 01:39	14797-55-8	H3
Sulfate	21.7	mg/L	1.2	0.16	1		06/09/17 01:39	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

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**Sample: MW 7S-GW-053117**      **Lab ID: 10391003005**      Collected: 05/31/17 13:10      Received: 06/02/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>8.3</b>	mg/L	0.20	0.075	10		06/09/17 15:08		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/14/17 16:18	06/15/17 08:27		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.67J</b>	mg/L	1.0	0.20	1		06/07/17 17:42	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

QC Batch: 478256 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 2605615 Matrix: Water  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/07/17 10:12	
Ethene	ug/L	<0.68	10.0	0.68	06/07/17 10:12	
Methane	ug/L	1.5J	10.0	1.1	06/07/17 10:12	

LABORATORY CONTROL SAMPLE & LCSD: 2605616

Parameter	Units	2605617								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	109	109	96	96	85-115	0	20	
Ethene	ug/L	106	103	102	97	96	85-115	1	20	
Methane	ug/L	60.7	57.9	57.4	95	95	85-115	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2605619

Parameter	Units	2605620										Qual
		60245647006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	ND	114	114	115	79.9	101	70	30-150	36	20	R1
Ethene	ug/L	ND	106	106	108	76.3	101	72	30-150	34	20	R1
Methane	ug/L	2.2J	60.7	60.7	62.0	43.7	99	68	30-150	35	20	R1

SAMPLE DUPLICATE: 2605618

Parameter	Units	10391003001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	0.80J	<0.68		20	
Methane	ug/L	<1.1	3.9J		20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

QC Batch: 478518 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 2606985 Matrix: Water  
 Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/12/17 14:29	

LABORATORY CONTROL SAMPLE: 2606986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606987 2606988

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.7	4.6	95	93	80-120	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

QC Batch: 478400 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 2606177 Matrix: Water  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/09/17 09:24	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/09/17 09:24	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/09/17 09:24	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/09/17 09:24	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/09/17 09:24	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/09/17 09:24	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/09/17 09:24	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/09/17 09:24	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/09/17 09:24	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/09/17 09:24	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/09/17 09:24	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/09/17 09:24	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/09/17 09:24	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/09/17 09:24	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/09/17 09:24	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/09/17 09:24	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/09/17 09:24	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/09/17 09:24	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/09/17 09:24	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/09/17 09:24	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/09/17 09:24	

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21000	105	80-120	
Antimony, Dissolved	ug/L	1000	1060	106	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1030	103	80-120	
Beryllium, Dissolved	ug/L	1000	1040	104	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19900	99	80-120	
Chromium, Dissolved	ug/L	1000	1010	101	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1000	100	80-120	
Iron, Dissolved	ug/L	20000	20200	101	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

LABORATORY CONTROL SAMPLE: 2606178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	500	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2606181 2606182

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10390958001 Result	Spike Conc.	Spike Conc.	MS Result							
Aluminum, Dissolved	ug/L	<13.5	20000	20000	21200	21700	106	109	75-125	2	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1060	1070	106	107	75-125	1	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1040	1060	104	106	75-125	2	20	
Barium, Dissolved	ug/L	36.8	1000	1000	1070	1080	103	105	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1050	1070	105	107	75-125	2	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	1030	1050	103	105	75-125	2	20	
Calcium, Dissolved	ug/L	34800	20000	20000	54400	55000	98	101	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	1010	1040	101	103	75-125	2	20	
Cobalt, Dissolved	ug/L	<0.51	1000	1000	1000	1020	100	102	75-125	2	20	
Copper, Dissolved	ug/L	227	1000	1000	1240	1260	101	103	75-125	2	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	20200	20700	101	104	75-125	2	20	
Lead, Dissolved	ug/L	2.7J	1000	1000	1030	1050	103	105	75-125	2	20	
Magnesium, Dissolved	ug/L	12200	20000	20000	32600	33000	102	104	75-125	1	20	
Manganese, Dissolved	ug/L	0.50J	1000	1000	1030	1050	103	105	75-125	2	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	1010	1030	101	103	75-125	2	20	
Potassium, Dissolved	ug/L	1730J	20000	20000	22500	22700	104	105	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1080	1090	107	109	75-125	2	20	
Silver, Dissolved	ug/L	<0.28	500	500	508	515	102	103	75-125	1	20	
Sodium, Dissolved	ug/L	18100	20000	20000	38100	38200	100	100	75-125	0	20	
Thallium, Dissolved	ug/L	5.0J	1000	1000	1010	1040	100	103	75-125	3	20	
Vanadium, Dissolved	ug/L	6.3J	1000	1000	1010	1020	100	102	75-125	2	20	
Zinc, Dissolved	ug/L	189	1000	1000	1180	1210	100	102	75-125	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

QC Batch: 479008

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10391003001, 10391003002

METHOD BLANK: 2609776

Matrix: Water

Associated Lab Samples: 10391003001, 10391003002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/10/17 09:30	

LABORATORY CONTROL SAMPLE & LCSD: 2609777

2609778

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.4	41.9	104	105	90-110	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609779

2609780

Parameter	Units	10390828002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	441	40	40	500	496	148	138	80-120	1	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609781

2609782

Parameter	Units	10390917001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	315	40	40	359	347	111	82	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

QC Batch: 479020 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10391003003, 10391003004, 10391003005

METHOD BLANK: 2609847 Matrix: Water  
Associated Lab Samples: 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/10/17 13:47	

LABORATORY CONTROL SAMPLE & LCSD: 2609848 2609849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.4	41.5	104	104	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609850 2609851

Parameter	Units	10390958001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	106	40	40	143	145	92	99	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609852 2609853

Parameter	Units	10391083002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	94.9	40	40	141	136	115	103	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

QC Batch: 478006

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 2604393

Matrix: Water

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/06/17 15:39	

LABORATORY CONTROL SAMPLE: 2604394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	942	94	80-120	

SAMPLE DUPLICATE: 2604395

Parameter	Units	10390815003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	301	300	0	10	

SAMPLE DUPLICATE: 2604396

Parameter	Units	10390958001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	299	305	2	10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

QC Batch: 82033

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 348613

Matrix: Water

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/07/17 09:32	

LABORATORY CONTROL SAMPLE: 348614

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 348616

Parameter	Units	10390833004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	102	75-125	

SAMPLE DUPLICATE: 348615

Parameter	Units	10390833004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

QC Batch: 478791

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 2608462

Matrix: Water

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/09/17 00:08	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/09/17 00:08	
Sulfate	mg/L	<0.16	1.2	0.16	06/09/17 00:08	

LABORATORY CONTROL SAMPLE: 2608463

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.2	106	90-110	
Nitrate as N	mg/L	1	1.1	107	90-110	
Sulfate	mg/L	12.5	13.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608464 2608465

Parameter	Units	10391449002		2608464		2608465		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	2.7	12.5	12.5	15.2	15.1	99	99	90-110	0	20		
Nitrate as N	mg/L	0.14	1	1	1.1	1.1	97	97	90-110	0	20		
Sulfate	mg/L	4.8	12.5	12.5	16.9	16.8	96	96	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

QC Batch: 478631 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004

METHOD BLANK: 2607471 Matrix: Water  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/08/17 13:58	FS

LABORATORY CONTROL SAMPLE: 2607472

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2607473 2607474

Parameter	Units	10391583001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.024	1	1	0.89	0.87	87	85	90-110	2	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2607475 2607476

Parameter	Units	10390555001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.81	0.84	81	84	90-110	3	20	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

QC Batch: 478945 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391003005

METHOD BLANK: 2609246 Matrix: Water  
Associated Lab Samples: 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/09/17 15:06	

LABORATORY CONTROL SAMPLE: 2609247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609248 2609249

Parameter	Units	10390956001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	17.8	17.1	100	94	90-110	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609250 2609251

Parameter	Units	10391312005	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	0.67	1	1	1.6	1.6	96	93	90-110	2	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

QC Batch: 479520 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 2611887 Matrix: Water  
Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/15/17 08:24	

LABORATORY CONTROL SAMPLE: 2611888

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	306	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611889 2611890

Parameter	Units	10390834001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	274	261	104	99	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611891 2611892

Parameter	Units	10391003001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	34.9J	250	250	294	291	104	102	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

QC Batch: 115712

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

METHOD BLANK: 456457

Matrix: Water

Associated Lab Samples: 10391003001, 10391003002, 10391003003, 10391003004, 10391003005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/07/17 14:51	

LABORATORY CONTROL SAMPLE: 456458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.6	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456459 456460

Parameter	Units	10390833004 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Total Organic Carbon	mg/L	0.46J	25	25	25.5	25.8	100	101	80-120	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 456461 456462

Parameter	Units	10390958001 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Total Organic Carbon	mg/L	0.34J	25	25	25.4	25.8	100	102	80-120	2	20		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391003

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391003001	MW 12S-GW-053117	RSK 175	478256		
10391003002	MW 11S-GW-053117	RSK 175	478256		
10391003003	MW 10S-GW-053117	RSK 175	478256		
10391003004	MW 13S-GW-053117	RSK 175	478256		
10391003005	MW 7S-GW-053117	RSK 175	478256		
10391003001	MW 12S-GW-053117	EPA 3010	478400	6010C Met	478860
10391003002	MW 11S-GW-053117	EPA 3010	478400	6010C Met	478860
10391003003	MW 10S-GW-053117	EPA 3010	478400	6010C Met	478860
10391003004	MW 13S-GW-053117	EPA 3010	478400	6010C Met	478860
10391003005	MW 7S-GW-053117	EPA 3010	478400	6010C Met	478860
10391003001	MW 12S-GW-053117	EPA 7470A	478518	EPA 7470A	479036
10391003002	MW 11S-GW-053117	EPA 7470A	478518	EPA 7470A	479036
10391003003	MW 10S-GW-053117	EPA 7470A	478518	EPA 7470A	479036
10391003004	MW 13S-GW-053117	EPA 7470A	478518	EPA 7470A	479036
10391003005	MW 7S-GW-053117	EPA 7470A	478518	EPA 7470A	479036
10391003001	MW 12S-GW-053117	SM 2320B	479008		
10391003002	MW 11S-GW-053117	SM 2320B	479008		
10391003003	MW 10S-GW-053117	SM 2320B	479020		
10391003004	MW 13S-GW-053117	SM 2320B	479020		
10391003005	MW 7S-GW-053117	SM 2320B	479020		
10391003001	MW 12S-GW-053117	SM 2540C	478006		
10391003002	MW 11S-GW-053117	SM 2540C	478006		
10391003003	MW 10S-GW-053117	SM 2540C	478006		
10391003004	MW 13S-GW-053117	SM 2540C	478006		
10391003005	MW 7S-GW-053117	SM 2540C	478006		
10391003001	MW 12S-GW-053117	SM 4500-S-2 D	82033		
10391003002	MW 11S-GW-053117	SM 4500-S-2 D	82033		
10391003003	MW 10S-GW-053117	SM 4500-S-2 D	82033		
10391003004	MW 13S-GW-053117	SM 4500-S-2 D	82033		
10391003005	MW 7S-GW-053117	SM 4500-S-2 D	82033		
10391003001	MW 12S-GW-053117	EPA 300.0	478791		
10391003002	MW 11S-GW-053117	EPA 300.0	478791		
10391003003	MW 10S-GW-053117	EPA 300.0	478791		
10391003004	MW 13S-GW-053117	EPA 300.0	478791		
10391003005	MW 7S-GW-053117	EPA 300.0	478791		
10391003001	MW 12S-GW-053117	EPA 353.2	478631		
10391003002	MW 11S-GW-053117	EPA 353.2	478631		
10391003003	MW 10S-GW-053117	EPA 353.2	478631		
10391003004	MW 13S-GW-053117	EPA 353.2	478631		
10391003005	MW 7S-GW-053117	EPA 353.2	478945		
10391003001	MW 12S-GW-053117	EPA 410.4	479520	EPA 410.4	479699
10391003002	MW 11S-GW-053117	EPA 410.4	479520	EPA 410.4	479699
10391003003	MW 10S-GW-053117	EPA 410.4	479520	EPA 410.4	479699
10391003004	MW 13S-GW-053117	EPA 410.4	479520	EPA 410.4	479699

**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391003

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391003005	MW 7S-GW-053117	EPA 410.4	479520	EPA 410.4	479699
10391003001	MW 12S-GW-053117	SM 5310C	115712		
10391003002	MW 11S-GW-053117	SM 5310C	115712		
10391003003	MW 10S-GW-053117	SM 5310C	115712		
10391003004	MW 13S-GW-053117	SM 5310C	115712		
10391003005	MW 7S-GW-053117	SM 5310C	115712		

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1039 1003

Page: 1 of 1  
**2133879**

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:			
Company: CH2M		Report To: Mark Ochsen, Dave Hudson		Attention:			
Address: 999 W Riverside Ave Suite 200		Copy To: Steve Dennis		Company Name: UPRR		<b>REGULATORY AGENCY</b>	
State: WA 99201				Address: CAS			
Email To: mark.ochsen@ch2m.com		Purchase Order No.:		Pace Quote Reference:		<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Phone:		Project Name: UPRR Freeman		Pace Project Manager:		Site Location: WA	
Requested Due Date/TAT: 10 day		Project Number: 1497		Pace Profile #: 364971#1		STATE: WA	

ITEM #	Section D Required Client Information  <b>SAMPLE ID</b> (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test (Y/N)	Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.								
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other													
					DATE	TIME	DATE	TIME																							
1	MW 125 - GW - 053117		WT	G			5-31-17	9:05	9					X															001		
2	MW 115 - GW - 053117							10:10																					002		
3	MW 105 - GW - 053117							11:10																					003		
4	MW 135 - GW - 053117							12:15																					004		
5	MW 75 - GW - 053117							13:10																					005		
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<i>[Signature]</i> CH2M	6-1-17	15:00	<i>[Signature]</i> PAC	6-2-17	9:45	3.2	Y	Y	Y

ORIGINAL	SAMPLER NAME AND SIGNATURE				Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER: Steve Dennis							
	SIGNATURE of SAMPLER: <i>[Signature]</i>							
	DATE Signed (MM/DD/YY): 6-1-17							



Document Name:  
Sample Condition Upon Receipt Form - ESI

Document Revised: 21Dec2016  
Page 1 of 2

Document No.:  
F-MN-L-210-rev.22

Issuing Authority:  
Pace Minnesota Quality Office

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name:  
CH2M

Project #:

WO#: **10391003**



10391003

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7096 3373 3679

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_

Thermometer Used:  151401163  151401164

Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.1      Cooler Temp Corrected (°C): 3.2      Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C      Correction Factor: 1.1      Date and Initials of Person Examining Contents: 6-2-17 AA

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>No MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH      Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-5</u> <u>1</u> <u>1</u> <u>1</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: (VOA) Coliform, TOC/DOC, Oil and Grease, DRO/BO15 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1115</u> Temp: <u>3.1</u>	Corrected Temp: <u>3.2</u>	
Time: <u>1135</u> put in cooler		
Time: _____      Temp: _____	Corrected Temp: _____	

Project Manager Review: \_\_\_\_\_

JENNI GROSS

Date: 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 2055627



Workorder: 10391003

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/2/2017

Results Requested By: 6/16/2017

Report To		Subcontract To				Requested Analysis																								
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333				<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">5636267 / 4500 Sulfide</div> <div style="border: 1px solid black; width: 100%; height: 100%;"></div> </div>																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix											Other	Preserved Containers				LAB USE ONLY									
1	MW 12S-GW-053117	PS	5/31/2017 09:05	10391003001	Water											1					X									
2	MW 11S-GW-053117	PS	5/31/2017 10:10	10391003002	Water											1					X									
3	MW 10S-GW-053117	PS	5/31/2017 11:10	10391003003	Water											1					X									
4	MW 13S-GW-053117	PS	5/31/2017 12:15	10391003004	Water											1					X									
5	MW 7S-GW-053117	PS	5/31/2017 13:10	10391003005	Water	1					X																			
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																								
1		<i>[Signature]</i> Pace MN	6/5/17 1335			<div style="font-size: 2em; font-weight: bold; text-align: center;">S</div>																								
2		<i>[Signature]</i> Fd EX	6/16/17 9:15	<i>[Signature]</i> PACO	6/16/17 9:15																									
3																														
Cooler Temperature on Receipt		3.4 °C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact						Y or N																	

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

# WO#: 2055627

PM: ADC

Due Date: 06/16/17

CLIENT: PASI-MINN

Project: \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-06-17 MB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present??	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

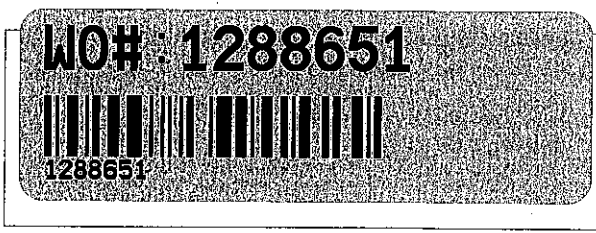
Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_



**Sample Condition Upon Receipt**

Client Name: Pace-MV Project #: WO# 1288651



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: 4oz Pax Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.1 Cooler Temp Corrected °C: 1.4 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: -0.3 Date and Initials of Person Examining Contents: JPK 6/15/17

Comments: mt 6/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>LOT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review:  Date: 6-6-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 08, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

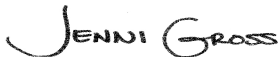
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391007

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 02, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391007001	MW12S-GW-053117	Water	05/31/17 09:05	06/02/17 09:45
10391007002	MW11S-GW-053117	Water	05/31/17 10:10	06/02/17 09:45
10391007003	MW10S-GW-053117	Water	05/31/17 11:10	06/02/17 09:45
10391007004	MW13S-GW-053117	Water	05/31/17 12:15	06/02/17 09:45
10391007005	MW7S-GW-053117	Water	05/31/17 13:10	06/02/17 09:45
10391007006	Trip Blank	Water	05/31/17 00:00	06/02/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391007001	MW12S-GW-053117	EPA 8260B	DJB	83	PASI-M
10391007002	MW11S-GW-053117	EPA 8260B	DJB	83	PASI-M
10391007003	MW10S-GW-053117	EPA 8260B	DJB	83	PASI-M
10391007004	MW13S-GW-053117	EPA 8260B	DJB	83	PASI-M
10391007005	MW7S-GW-053117	EPA 8260B	DJB	83	PASI-M
10391007006	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391007001</b>	<b>MW12S-GW-053117</b>					
EPA 8260B	1,2,4-Trimethylbenzene	1.1	ug/L	0.50	06/07/17 22:43	
EPA 8260B	1,3,5-Trimethylbenzene	0.40J	ug/L	0.50	06/07/17 22:43	
EPA 8260B	2,2,4-Trimethylpentane	0.75J	ug/L	4.0	06/07/17 22:43	
EPA 8260B	Acetone	11.6J	ug/L	20.0	06/07/17 22:43	
EPA 8260B	Chloromethane	1.6J	ug/L	4.0	06/07/17 22:43	
EPA 8260B	Toluene	0.21J	ug/L	1.0	06/07/17 22:43	
EPA 8260B	m&p-Xylene	0.17J	ug/L	1.0	06/07/17 22:43	
EPA 8260B	n-Propylbenzene	0.059J	ug/L	0.50	06/07/17 22:43	
EPA 8260B	o-Xylene	0.24J	ug/L	0.50	06/07/17 22:43	
<b>10391007002</b>	<b>MW11S-GW-053117</b>					
EPA 8260B	1,2,4-Trimethylbenzene	0.98	ug/L	0.50	06/07/17 23:05	
EPA 8260B	1,3,5-Trimethylbenzene	0.36J	ug/L	0.50	06/07/17 23:05	
EPA 8260B	2,2,4-Trimethylpentane	0.56J	ug/L	4.0	06/07/17 23:05	
EPA 8260B	Toluene	0.098J	ug/L	1.0	06/07/17 23:05	
EPA 8260B	m&p-Xylene	0.11J	ug/L	1.0	06/07/17 23:05	
EPA 8260B	o-Xylene	0.15J	ug/L	0.50	06/07/17 23:05	
<b>10391007003</b>	<b>MW10S-GW-053117</b>					
EPA 8260B	2,2,4-Trimethylpentane	0.45J	ug/L	4.0	06/07/17 23:27	
EPA 8260B	Carbon disulfide	0.66J	ug/L	1.0	06/07/17 23:27	
EPA 8260B	Carbon tetrachloride	34.0	ug/L	0.50	06/07/17 23:27	
EPA 8260B	Chloroform	2.3	ug/L	1.0	06/07/17 23:27	
<b>10391007004</b>	<b>MW13S-GW-053117</b>					
EPA 8260B	1,2,4-Trimethylbenzene	0.69	ug/L	0.50	06/07/17 23:48	
EPA 8260B	1,3,5-Trimethylbenzene	0.18J	ug/L	0.50	06/07/17 23:48	
EPA 8260B	2,2,4-Trimethylpentane	0.36J	ug/L	4.0	06/07/17 23:48	
EPA 8260B	Acetone	1.8J	ug/L	20.0	06/07/17 23:48	
EPA 8260B	Chloromethane	0.76J	ug/L	4.0	06/07/17 23:48	
EPA 8260B	Toluene	0.10J	ug/L	1.0	06/07/17 23:48	
EPA 8260B	o-Xylene	0.071J	ug/L	0.50	06/07/17 23:48	
<b>10391007005</b>	<b>MW7S-GW-053117</b>					
EPA 8260B	Acetone	5.3J	ug/L	20.0	06/08/17 00:10	
EPA 8260B	Carbon tetrachloride	1.3	ug/L	0.50	06/08/17 00:10	
EPA 8260B	Chloromethane	0.58J	ug/L	4.0	06/08/17 00:10	
<b>10391007006</b>	<b>Trip Blank</b>					
EPA 8260B	Chloroform	0.31J	ug/L	1.0	06/07/17 19:47	
EPA 8260B	Methylene Chloride	0.36J	ug/L	4.0	06/07/17 19:47	
EPA 8260B	Toluene	0.061J	ug/L	1.0	06/07/17 19:47	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391007

---

**Method:** EPA 8260B  
**Description:** 8260B MSV Low Level  
**Client:** UPRR\_CH2M Hill  
**Date:** June 08, 2017

### General Information:

6 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 478331

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10391016012

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2605858)
  - Tetrahydrofuran
- MSD (Lab ID: 2605859)
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Sample: **MW12S-GW-053117** Lab ID: **10391007001** Collected: 05/31/17 09:05 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 22:43	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/07/17 22:43	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 22:43	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 22:43	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/07/17 22:43	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 22:43	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/07/17 22:43	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/07/17 22:43	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/07/17 22:43	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/07/17 22:43	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/07/17 22:43	120-82-1	
1,2,4-Trimethylbenzene	1.1	ug/L	0.50	0.068	1		06/07/17 22:43	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/07/17 22:43	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/07/17 22:43	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/07/17 22:43	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/07/17 22:43	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/07/17 22:43	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/07/17 22:43	78-87-5	
1,3,5-Trimethylbenzene	0.40J	ug/L	0.50	0.042	1		06/07/17 22:43	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/07/17 22:43	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/07/17 22:43	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/07/17 22:43	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/07/17 22:43	123-91-1	
2,2,4-Trimethylpentane	0.75J	ug/L	4.0	0.087	1		06/07/17 22:43	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/07/17 22:43	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/07/17 22:43	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/07/17 22:43	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/07/17 22:43	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/07/17 22:43	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/07/17 22:43	108-10-1	
Acetone	11.6J	ug/L	20.0	0.64	1		06/07/17 22:43	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/07/17 22:43	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/07/17 22:43	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/07/17 22:43	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/07/17 22:43	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/07/17 22:43	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/07/17 22:43	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/07/17 22:43	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/07/17 22:43	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/07/17 22:43	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/07/17 22:43	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/07/17 22:43	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/07/17 22:43	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/07/17 22:43	67-66-3	
Chloromethane	1.6J	ug/L	4.0	0.080	1		06/07/17 22:43	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/07/17 22:43	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

**Sample: MW12S-GW-053117**      **Lab ID: 10391007001**      Collected: 05/31/17 09:05      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/07/17 22:43	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/07/17 22:43	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/07/17 22:43	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/07/17 22:43	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/07/17 22:43	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/07/17 22:43	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/07/17 22:43	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/07/17 22:43	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/07/17 22:43	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/07/17 22:43	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/07/17 22:43	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/07/17 22:43	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/07/17 22:43	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/07/17 22:43	109-99-9	
Toluene	0.21J	ug/L	1.0	0.059	1		06/07/17 22:43	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/07/17 22:43	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/07/17 22:43	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/07/17 22:43	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/07/17 22:43	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/07/17 22:43	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/07/17 22:43	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/07/17 22:43	10061-01-5	
m&p-Xylene	0.17J	ug/L	1.0	0.11	1		06/07/17 22:43	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/07/17 22:43	104-51-8	
n-Propylbenzene	0.059J	ug/L	0.50	0.049	1		06/07/17 22:43	103-65-1	
o-Xylene	0.24J	ug/L	0.50	0.044	1		06/07/17 22:43	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/07/17 22:43	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/07/17 22:43	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/07/17 22:43	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/07/17 22:43	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/07/17 22:43	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/07/17 22:43	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/07/17 22:43	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/07/17 22:43	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		06/07/17 22:43	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/07/17 22:43	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/07/17 22:43	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Sample: **MW11S-GW-053117** Lab ID: **10391007002** Collected: 05/31/17 10:10 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 23:05	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/07/17 23:05	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:05	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 23:05	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/07/17 23:05	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:05	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/07/17 23:05	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/07/17 23:05	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/07/17 23:05	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/07/17 23:05	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/07/17 23:05	120-82-1	
1,2,4-Trimethylbenzene	0.98	ug/L	0.50	0.068	1		06/07/17 23:05	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/07/17 23:05	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/07/17 23:05	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/07/17 23:05	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/07/17 23:05	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/07/17 23:05	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/07/17 23:05	78-87-5	
1,3,5-Trimethylbenzene	0.36J	ug/L	0.50	0.042	1		06/07/17 23:05	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/07/17 23:05	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/07/17 23:05	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/07/17 23:05	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/07/17 23:05	123-91-1	
2,2,4-Trimethylpentane	0.56J	ug/L	4.0	0.087	1		06/07/17 23:05	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/07/17 23:05	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/07/17 23:05	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/07/17 23:05	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/07/17 23:05	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/07/17 23:05	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/07/17 23:05	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/07/17 23:05	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/07/17 23:05	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/07/17 23:05	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/07/17 23:05	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/07/17 23:05	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/07/17 23:05	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/07/17 23:05	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/07/17 23:05	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/07/17 23:05	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/07/17 23:05	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/07/17 23:05	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/07/17 23:05	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/07/17 23:05	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/07/17 23:05	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/07/17 23:05	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/07/17 23:05	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Sample: **MW11S-GW-053117** Lab ID: **10391007002** Collected: 05/31/17 10:10 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/07/17 23:05	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/07/17 23:05	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/07/17 23:05	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/07/17 23:05	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/07/17 23:05	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/07/17 23:05	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/07/17 23:05	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/07/17 23:05	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/07/17 23:05	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/07/17 23:05	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/07/17 23:05	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/07/17 23:05	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/07/17 23:05	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/07/17 23:05	109-99-9	
Toluene	0.098J	ug/L	1.0	0.059	1		06/07/17 23:05	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/07/17 23:05	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:05	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/07/17 23:05	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/07/17 23:05	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/07/17 23:05	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/07/17 23:05	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/07/17 23:05	10061-01-5	
m&p-Xylene	0.11J	ug/L	1.0	0.11	1		06/07/17 23:05	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/07/17 23:05	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/07/17 23:05	103-65-1	
o-Xylene	0.15J	ug/L	0.50	0.044	1		06/07/17 23:05	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/07/17 23:05	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/07/17 23:05	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/07/17 23:05	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/07/17 23:05	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/07/17 23:05	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/07/17 23:05	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/07/17 23:05	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/07/17 23:05	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		06/07/17 23:05	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		06/07/17 23:05	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/07/17 23:05	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Sample: **MW10S-GW-053117** Lab ID: **10391007003** Collected: 05/31/17 11:10 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 23:27	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/07/17 23:27	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:27	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 23:27	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/07/17 23:27	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:27	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/07/17 23:27	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/07/17 23:27	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/07/17 23:27	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/07/17 23:27	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/07/17 23:27	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/07/17 23:27	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/07/17 23:27	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/07/17 23:27	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/07/17 23:27	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/07/17 23:27	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/07/17 23:27	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/07/17 23:27	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/07/17 23:27	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/07/17 23:27	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/07/17 23:27	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/07/17 23:27	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/07/17 23:27	123-91-1	
2,2,4-Trimethylpentane	0.45J	ug/L	4.0	0.087	1		06/07/17 23:27	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/07/17 23:27	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/07/17 23:27	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/07/17 23:27	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/07/17 23:27	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/07/17 23:27	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/07/17 23:27	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/07/17 23:27	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/07/17 23:27	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/07/17 23:27	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/07/17 23:27	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/07/17 23:27	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/07/17 23:27	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/07/17 23:27	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/07/17 23:27	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/07/17 23:27	74-83-9	
Carbon disulfide	0.66J	ug/L	1.0	0.20	1		06/07/17 23:27	75-15-0	
Carbon tetrachloride	34.0	ug/L	0.50	0.079	1		06/07/17 23:27	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/07/17 23:27	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/07/17 23:27	75-00-3	
Chloroform	2.3	ug/L	1.0	0.21	1		06/07/17 23:27	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/07/17 23:27	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/07/17 23:27	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

**Sample: MW10S-GW-053117**      **Lab ID: 10391007003**      Collected: 05/31/17 11:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/07/17 23:27	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/07/17 23:27	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/07/17 23:27	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/07/17 23:27	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/07/17 23:27	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/07/17 23:27	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/07/17 23:27	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/07/17 23:27	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/07/17 23:27	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/07/17 23:27	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/07/17 23:27	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/07/17 23:27	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/07/17 23:27	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/07/17 23:27	109-99-9	
Toluene	<0.059	ug/L	1.0	0.059	1		06/07/17 23:27	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/07/17 23:27	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:27	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/07/17 23:27	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/07/17 23:27	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/07/17 23:27	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/07/17 23:27	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/07/17 23:27	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/07/17 23:27	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/07/17 23:27	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/07/17 23:27	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/07/17 23:27	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/07/17 23:27	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/07/17 23:27	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/07/17 23:27	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/07/17 23:27	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/07/17 23:27	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/07/17 23:27	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/07/17 23:27	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/07/17 23:27	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		1		06/07/17 23:27	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/07/17 23:27	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/07/17 23:27	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Sample: **MW13S-GW-053117** Lab ID: **10391007004** Collected: 05/31/17 12:15 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 23:48	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/07/17 23:48	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:48	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 23:48	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/07/17 23:48	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:48	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/07/17 23:48	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/07/17 23:48	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/07/17 23:48	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/07/17 23:48	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/07/17 23:48	120-82-1	
1,2,4-Trimethylbenzene	0.69	ug/L	0.50	0.068	1		06/07/17 23:48	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/07/17 23:48	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/07/17 23:48	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/07/17 23:48	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/07/17 23:48	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/07/17 23:48	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/07/17 23:48	78-87-5	
1,3,5-Trimethylbenzene	0.18J	ug/L	0.50	0.042	1		06/07/17 23:48	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/07/17 23:48	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/07/17 23:48	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/07/17 23:48	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/07/17 23:48	123-91-1	
2,2,4-Trimethylpentane	0.36J	ug/L	4.0	0.087	1		06/07/17 23:48	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/07/17 23:48	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/07/17 23:48	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/07/17 23:48	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/07/17 23:48	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/07/17 23:48	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/07/17 23:48	108-10-1	
Acetone	1.8J	ug/L	20.0	0.64	1		06/07/17 23:48	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/07/17 23:48	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/07/17 23:48	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/07/17 23:48	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/07/17 23:48	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/07/17 23:48	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/07/17 23:48	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/07/17 23:48	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/07/17 23:48	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/07/17 23:48	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/07/17 23:48	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/07/17 23:48	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/07/17 23:48	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/07/17 23:48	67-66-3	
Chloromethane	0.76J	ug/L	4.0	0.080	1		06/07/17 23:48	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/07/17 23:48	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Sample: MW13S-GW-053117 Lab ID: 10391007004 Collected: 05/31/17 12:15 Received: 06/02/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/07/17 23:48	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/07/17 23:48	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/07/17 23:48	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/07/17 23:48	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/07/17 23:48	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/07/17 23:48	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/07/17 23:48	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/07/17 23:48	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/07/17 23:48	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/07/17 23:48	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/07/17 23:48	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/07/17 23:48	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/07/17 23:48	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/07/17 23:48	109-99-9	
Toluene	0.10J	ug/L	1.0	0.059	1		06/07/17 23:48	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/07/17 23:48	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/07/17 23:48	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/07/17 23:48	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/07/17 23:48	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/07/17 23:48	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/07/17 23:48	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/07/17 23:48	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/07/17 23:48	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/07/17 23:48	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/07/17 23:48	103-65-1	
o-Xylene	0.071J	ug/L	0.50	0.044	1		06/07/17 23:48	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/07/17 23:48	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/07/17 23:48	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/07/17 23:48	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/07/17 23:48	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/07/17 23:48	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/07/17 23:48	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/07/17 23:48	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/07/17 23:48	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		06/07/17 23:48	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/07/17 23:48	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		06/07/17 23:48	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

**Sample: MW7S-GW-053117**      **Lab ID: 10391007005**      Collected: 05/31/17 13:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 00:10	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/08/17 00:10	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 00:10	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/08/17 00:10	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/08/17 00:10	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/08/17 00:10	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/08/17 00:10	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/08/17 00:10	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/08/17 00:10	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/08/17 00:10	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/08/17 00:10	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/08/17 00:10	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/08/17 00:10	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/08/17 00:10	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/08/17 00:10	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/08/17 00:10	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/08/17 00:10	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/08/17 00:10	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/08/17 00:10	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/08/17 00:10	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/08/17 00:10	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/08/17 00:10	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/08/17 00:10	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/08/17 00:10	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/08/17 00:10	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/08/17 00:10	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/08/17 00:10	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/08/17 00:10	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/08/17 00:10	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/08/17 00:10	108-10-1	
Acetone	5.3J	ug/L	20.0	0.64	1		06/08/17 00:10	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/08/17 00:10	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/08/17 00:10	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/08/17 00:10	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/08/17 00:10	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/08/17 00:10	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/08/17 00:10	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/08/17 00:10	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/08/17 00:10	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/08/17 00:10	75-15-0	
Carbon tetrachloride	1.3	ug/L	0.50	0.079	1		06/08/17 00:10	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/08/17 00:10	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/08/17 00:10	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/08/17 00:10	67-66-3	
Chloromethane	0.58J	ug/L	4.0	0.080	1		06/08/17 00:10	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/08/17 00:10	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

**Sample: MW7S-GW-053117**      **Lab ID: 10391007005**      Collected: 05/31/17 13:10      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/08/17 00:10	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/08/17 00:10	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/08/17 00:10	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/08/17 00:10	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/08/17 00:10	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/08/17 00:10	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/08/17 00:10	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/08/17 00:10	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/08/17 00:10	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/08/17 00:10	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/08/17 00:10	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/08/17 00:10	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/08/17 00:10	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/08/17 00:10	109-99-9	
Toluene	<0.059	ug/L	1.0	0.059	1		06/08/17 00:10	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/08/17 00:10	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/08/17 00:10	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/08/17 00:10	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/08/17 00:10	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/08/17 00:10	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/08/17 00:10	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/08/17 00:10	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/08/17 00:10	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/08/17 00:10	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/08/17 00:10	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/08/17 00:10	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/08/17 00:10	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/08/17 00:10	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/08/17 00:10	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/08/17 00:10	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/08/17 00:10	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/08/17 00:10	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/08/17 00:10	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/08/17 00:10	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		06/08/17 00:10	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/08/17 00:10	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		06/08/17 00:10	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

**Sample: Trip Blank**      **Lab ID: 10391007006**      Collected: 05/31/17 00:00      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/07/17 19:47	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 19:47	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/07/17 19:47	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/07/17 19:47	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/07/17 19:47	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/07/17 19:47	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/07/17 19:47	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/07/17 19:47	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/07/17 19:47	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/07/17 19:47	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/07/17 19:47	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/07/17 19:47	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/07/17 19:47	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/07/17 19:47	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/07/17 19:47	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/07/17 19:47	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/07/17 19:47	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/07/17 19:47	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/07/17 19:47	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/07/17 19:47	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/07/17 19:47	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/07/17 19:47	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/07/17 19:47	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/07/17 19:47	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/07/17 19:47	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/07/17 19:47	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/07/17 19:47	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/07/17 19:47	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/07/17 19:47	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/07/17 19:47	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/07/17 19:47	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/07/17 19:47	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/07/17 19:47	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/07/17 19:47	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/07/17 19:47	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/07/17 19:47	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/07/17 19:47	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/07/17 19:47	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/07/17 19:47	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/07/17 19:47	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/07/17 19:47	75-00-3	
Chloroform	0.31J	ug/L	1.0	0.21	1		06/07/17 19:47	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/07/17 19:47	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/07/17 19:47	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

**Sample: Trip Blank**      **Lab ID: 10391007006**      Collected: 05/31/17 00:00      Received: 06/02/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/07/17 19:47	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/07/17 19:47	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/07/17 19:47	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/07/17 19:47	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/07/17 19:47	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/07/17 19:47	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/07/17 19:47	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/07/17 19:47	1634-04-4	
Methylene Chloride	0.36J	ug/L	4.0	0.097	1		06/07/17 19:47	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/07/17 19:47	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/07/17 19:47	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/07/17 19:47	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/07/17 19:47	109-99-9	
Toluene	0.061J	ug/L	1.0	0.059	1		06/07/17 19:47	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/07/17 19:47	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/07/17 19:47	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/07/17 19:47	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/07/17 19:47	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/07/17 19:47	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/07/17 19:47	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/07/17 19:47	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/07/17 19:47	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/07/17 19:47	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/07/17 19:47	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/07/17 19:47	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/07/17 19:47	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/07/17 19:47	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/07/17 19:47	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/07/17 19:47	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/07/17 19:47	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/07/17 19:47	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/07/17 19:47	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/07/17 19:47	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		06/07/17 19:47	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/07/17 19:47	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/07/17 19:47	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391007

QC Batch: 478331 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391007001, 10391007002, 10391007003, 10391007004, 10391007005, 10391007006

METHOD BLANK: 2605856 Matrix: Water  
Associated Lab Samples: 10391007001, 10391007002, 10391007003, 10391007004, 10391007005, 10391007006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/07/17 17:14	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/07/17 17:14	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/07/17 17:14	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/07/17 17:14	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/07/17 17:14	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/07/17 17:14	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/07/17 17:14	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/07/17 17:14	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/07/17 17:14	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/07/17 17:14	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/07/17 17:14	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/07/17 17:14	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/07/17 17:14	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/07/17 17:14	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/07/17 17:14	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/07/17 17:14	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/07/17 17:14	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/07/17 17:14	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/07/17 17:14	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/07/17 17:14	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/07/17 17:14	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/07/17 17:14	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/07/17 17:14	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/07/17 17:14	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/07/17 17:14	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/07/17 17:14	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/07/17 17:14	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/07/17 17:14	
Acetone	ug/L	<0.64	20.0	0.64	06/07/17 17:14	
Acrolein	ug/L	<2.1	10.0	2.1	06/07/17 17:14	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/07/17 17:14	
Benzene	ug/L	<0.042	0.50	0.042	06/07/17 17:14	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/07/17 17:14	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/07/17 17:14	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/07/17 17:14	
Bromoform	ug/L	<0.11	4.0	0.11	06/07/17 17:14	
Bromomethane	ug/L	<0.20	4.0	0.20	06/07/17 17:14	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/07/17 17:14	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/07/17 17:14	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391007

METHOD BLANK: 2605856

Matrix: Water

Associated Lab Samples: 10391007001, 10391007002, 10391007003, 10391007004, 10391007005, 10391007006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/07/17 17:14	
Chloroethane	ug/L	<0.12	1.0	0.12	06/07/17 17:14	
Chloroform	ug/L	<0.21	1.0	0.21	06/07/17 17:14	
Chloromethane	ug/L	<0.080	4.0	0.080	06/07/17 17:14	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/07/17 17:14	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/07/17 17:14	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/07/17 17:14	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/07/17 17:14	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/07/17 17:14	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/07/17 17:14	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/07/17 17:14	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/07/17 17:14	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/07/17 17:14	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/07/17 17:14	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/07/17 17:14	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/07/17 17:14	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/07/17 17:14	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/07/17 17:14	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/07/17 17:14	
Naphthalene	ug/L	<0.064	1.0	0.064	06/07/17 17:14	
o-Xylene	ug/L	<0.044	0.50	0.044	06/07/17 17:14	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/07/17 17:14	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/07/17 17:14	
Styrene	ug/L	<0.056	0.50	0.056	06/07/17 17:14	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/07/17 17:14	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/07/17 17:14	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/07/17 17:14	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/07/17 17:14	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/07/17 17:14	
Toluene	ug/L	<0.059	1.0	0.059	06/07/17 17:14	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/07/17 17:14	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/07/17 17:14	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/07/17 17:14	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/07/17 17:14	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/07/17 17:14	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/07/17 17:14	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/07/17 17:14	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/07/17 17:14	
1,2-Dichloroethane-d4 (S)	%	100	75-137		06/07/17 17:14	
4-Bromofluorobenzene (S)	%	102	75-125		06/07/17 17:14	
Toluene-d8 (S)	%	100	75-125		06/07/17 17:14	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

LABORATORY CONTROL SAMPLE: 2605857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.6	103	75-136	
1,1,1-Trichloroethane	ug/L	20	19.5	97	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.4	102	71-138	
1,1,2-Trichloroethane	ug/L	20	18.9	95	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.0	100	69-126	
1,1-Dichloroethane	ug/L	20	19.0	95	75-125	
1,1-Dichloroethene	ug/L	20	19.1	95	75-125	
1,1-Dichloropropene	ug/L	20	20.2	101	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.3	102	75-125	
1,2,3-Trichloropropane	ug/L	20	21.3	107	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.9	100	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.4	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.0	106	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.1	105	75-125	
1,2-Dichlorobenzene	ug/L	20	21.2	106	75-125	
1,2-Dichloroethane	ug/L	20	19.6	98	70-125	
1,2-Dichloroethene (Total)	ug/L	40	38.5	96	75-125	
1,2-Dichloropropane	ug/L	20	19.8	99	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.6	103	75-125	
1,3-Dichlorobenzene	ug/L	20	20.1	101	75-125	
1,3-Dichloropropane	ug/L	20	21.1	105	75-125	
1,4-Dichlorobenzene	ug/L	20	19.7	99	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	409	102	64-140	
2,2,4-Trimethylpentane	ug/L	20	19.8	99	68-125	
2,2-Dichloropropane	ug/L	20	19.0	95	70-131	
2-Butanone (MEK)	ug/L	100	95.8	96	69-125	
2-Chlorotoluene	ug/L	20	20.6	103	75-125	
2-Hexanone	ug/L	100	109	109	73-129	
4-Chlorotoluene	ug/L	20	20.9	104	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	105	73-125	
Acetone	ug/L	100	96.0	96	66-126	
Acrolein	ug/L	200	214	107	56-150	
Acrylonitrile	ug/L	200	194	97	68-129	
Benzene	ug/L	20	19.4	97	75-125	
Bromobenzene	ug/L	20	20.2	101	75-125	
Bromochloromethane	ug/L	20	19.9	100	75-126	
Bromodichloromethane	ug/L	20	20.1	100	75-133	
Bromoform	ug/L	20	19.6	98	62-142	
Bromomethane	ug/L	20	20.9	105	34-143	
Carbon disulfide	ug/L	20	18.4	92	71-125	
Carbon tetrachloride	ug/L	20	20.8	104	71-145	
Chlorobenzene	ug/L	20	19.9	100	75-125	
Chloroethane	ug/L	20	18.7	93	75-125	
Chloroform	ug/L	20	19.0	95	75-125	
Chloromethane	ug/L	20	18.8	94	54-125	
cis-1,2-Dichloroethene	ug/L	20	19.6	98	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

LABORATORY CONTROL SAMPLE: 2605857

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	19.7	99	74-141	
Dibromomethane	ug/L	20	21.0	105	75-125	
Dichlorodifluoromethane	ug/L	20	19.6	98	59-130	
Dichlorofluoromethane	ug/L	20	19.1	95	75-125	
Diisopropyl ether	ug/L	20	19.0	95	69-125	
Ethyl-tert-butyl ether	ug/L	20	20.2	101	73-125	
Ethylbenzene	ug/L	20	19.6	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.1	105	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.9	105	75-125	
m&p-Xylene	ug/L	40	40.9	102	75-125	
Methyl-tert-butyl ether	ug/L	20	19.9	99	75-125	
Methylene Chloride	ug/L	20	18.4	92	73-125	
n-Butylbenzene	ug/L	20	20.8	104	75-125	
n-Propylbenzene	ug/L	20	20.3	101	75-125	
Naphthalene	ug/L	20	20.4	102	74-125	
o-Xylene	ug/L	20	21.3	107	75-125	
p-Isopropyltoluene	ug/L	20	19.4	97	75-125	
sec-Butylbenzene	ug/L	20	20.8	104	75-125	
Styrene	ug/L	20	19.2	96	75-125	
tert-Amylmethyl ether	ug/L	20	20.3	101	71-126	
tert-Butyl Alcohol	ug/L	200	203	101	69-131	
tert-Butylbenzene	ug/L	20	20.6	103	75-125	
Tetrachloroethene	ug/L	20	19.9	99	75-125	
Tetrahydrofuran	ug/L	200	216	108	65-127	
Toluene	ug/L	20	18.2	91	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.4	99	30-150	
Trichloroethene	ug/L	20	19.2	96	75-125	
Trichlorofluoromethane	ug/L	20	19.7	99	71-140	
Vinyl acetate	ug/L	20	18.9	94	68-137	
Vinyl chloride	ug/L	20	19.1	96	70-125	
Xylene (Total)	ug/L	60	62.2	104	75-125	
1,2-Dichloroethane-d4 (S)	%			97	75-137	
4-Bromofluorobenzene (S)	%			102	75-125	
Toluene-d8 (S)	%			99	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2605858 2605859

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result								
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	20	22.2	22.1	111	111	75-137	0	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	20	21.3	21.5	107	107	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	20	20.9	21.0	105	105	60-142	1	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	20	19.4	19.2	97	96	75-128	1	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Parameter	Units	10391016012		2605858		2605859		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	24.1	23.4	121	117	62-150	3	30		
1,1-Dichloroethane	ug/L	ND	20	20	20.2	20.2	101	101	70-129	0	30		
1,1-Dichloroethene	ug/L	ND	20	20	21.3	20.8	106	104	67-141	2	30		
1,1-Dichloropropene	ug/L	ND	20	20	22.6	22.6	113	113	64-144	0	30		
1,2,3-Trichlorobenzene	ug/L	ND	20	20	20.7	19.6	103	98	66-139	5	30		
1,2,3-Trichloropropane	ug/L	ND	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	ND	20	20	20.6	19.9	103	100	65-138	3	30		
1,2,4-Trimethylbenzene	ug/L	ND	20	20	20.7	20.4	103	102	65-143	1	30		
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	52.7	54.3	105	109	61-134	3	30		
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	22.0	21.9	108	108	74-129	0	30		
1,2-Dichlorobenzene	ug/L	ND	20	20	21.7	21.6	108	108	68-135	0	30		
1,2-Dichloroethane	ug/L	ND	20	20	19.9	20.0	100	100	73-125	0	30		
1,2-Dichloroethene (Total)	ug/L	ND	40	40	41.0	40.6	102	102	69-134	1	30		
1,2-Dichloropropane	ug/L	ND	20	20	20.8	20.9	104	105	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	ND	20	20	22.4	21.9	112	110	64-146	2	30		
1,3-Dichlorobenzene	ug/L	ND	20	20	20.9	21.0	105	105	69-135	0	30		
1,3-Dichloropropane	ug/L	ND	20	20	21.5	21.5	107	108	67-128	0	30		
1,4-Dichlorobenzene	ug/L	ND	20	20	20.6	20.5	103	102	66-134	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	413	392	103	98	58-140	5	30		
2,2,4-Trimethylpentane	ug/L	ND	20	20	24.2	23.1	121	115	48-150	5	30		
2,2-Dichloropropane	ug/L	ND	20	20	21.9	21.2	110	106	50-150	3	30		
2-Butanone (MEK)	ug/L	ND	100	100	96.3	97.3	94	95	58-125	1	30		
2-Chlorotoluene	ug/L	ND	20	20	21.8	22.2	109	111	65-138	2	30		
2-Hexanone	ug/L	ND	100	100	110	111	110	111	61-134	1	30		
4-Chlorotoluene	ug/L	ND	20	20	22.4	22.2	112	111	68-135	1	30		
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	106	108	106	108	61-130	1	30		
Acetone	ug/L	103	100	100	191	202	88	98	51-140	5	30		
Acrolein	ug/L	ND	200	200	250	249	125	125	48-150	0	30		
Acrylonitrile	ug/L	ND	200	200	193	195	97	97	55-134	1	30		
Benzene	ug/L	ND	20	20	20.6	20.6	103	103	63-132	0	30		
Bromobenzene	ug/L	ND	20	20	21.0	21.0	105	105	67-138	0	30		
Bromochloromethane	ug/L	ND	20	20	20.7	20.2	103	101	66-138	2	30		
Bromodichloromethane	ug/L	ND	20	20	21.7	21.7	109	108	75-137	0	30		
Bromoform	ug/L	ND	20	20	20.2	19.9	101	100	65-129	1	30		
Bromomethane	ug/L	ND	20	20	22.5	22.2	113	111	41-150	2	30		
Carbon disulfide	ug/L	ND	20	20	20.3	19.8	102	99	72-132	3	30		
Carbon tetrachloride	ug/L	ND	20	20	23.6	22.8	118	114	75-150	3	30		
Chlorobenzene	ug/L	ND	20	20	21.0	21.0	105	105	73-127	0	30		
Chloroethane	ug/L	ND	20	20	21.1	20.5	105	103	74-138	3	30		
Chloroform	ug/L	ND	20	20	20.1	19.9	100	99	74-125	1	30		
Chloromethane	ug/L	ND	20	20	20.7	20.0	103	100	58-129	3	30		
cis-1,2-Dichloroethene	ug/L	ND	20	20	20.3	20.3	102	101	63-135	0	30		
cis-1,3-Dichloropropene	ug/L	ND	20	20	19.7	20.0	99	100	66-129	1	30		
Dibromochloromethane	ug/L	ND	20	20	20.7	20.6	103	103	75-133	0	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391007

Parameter	Units	2605858		2605859		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10391016012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	ND	20	20	21.9	22.2	110	111	68-134	1	30		
Dichlorodifluoromethane	ug/L	ND	20	20	23.6	22.6	118	113	72-150	4	30		
Dichlorofluoromethane	ug/L	ND	20	20	20.7	20.5	104	102	75-129	1	30		
Diisopropyl ether	ug/L	ND	20	20	19.8	19.5	99	98	62-128	1	30		
Ethyl-tert-butyl ether	ug/L	ND	20	20	21.0	20.9	105	104	63-132	1	30		
Ethylbenzene	ug/L	ND	20	20	21.2	21.5	106	107	72-130	1	30		
Hexachloro-1,3-butadiene	ug/L	ND	20	20	23.2	22.0	116	110	71-150	5	30		
Isopropylbenzene (Cumene)	ug/L	ND	20	20	23.0	22.7	115	114	70-136	1	30		
m&p-Xylene	ug/L	ND	40	40	45.1	44.4	113	111	64-142	2	30		
Methyl-tert-butyl ether	ug/L	ND	20	20	20.2	20.1	101	101	72-125	1	30		
Methylene Chloride	ug/L	ND	20	20	18.3	18.1	92	90	60-132	1	30		
n-Butylbenzene	ug/L	ND	20	20	22.9	22.1	114	110	60-150	4	30		
n-Propylbenzene	ug/L	ND	20	20	22.2	22.0	111	110	63-142	1	30		
Naphthalene	ug/L	ND	20	20	20.3	20.1	102	101	67-125	1	30		
o-Xylene	ug/L	ND	20	20	23.1	22.9	116	114	60-143	1	30		
p-Isopropyltoluene	ug/L	ND	20	20	21.2	20.8	106	104	64-146	2	30		
sec-Butylbenzene	ug/L	ND	20	20	23.1	22.8	115	114	67-144	1	30		
Styrene	ug/L	ND	20	20	20.0	19.9	100	100	67-136	0	30		
tert-Amylmethyl ether	ug/L	ND	20	20	20.8	20.7	104	104	60-134	0	30		
tert-Butyl Alcohol	ug/L	ND	200	200	212	204	102	98	56-146	4	30		
tert-Butylbenzene	ug/L	ND	20	20	22.7	22.4	114	112	68-135	2	30		
Tetrachloroethene	ug/L	ND	20	20	22.3	21.9	112	109	67-148	2	30		
Tetrahydrofuran	ug/L	ND	200	200	367	358	184	179	51-141	3	30	M1	
Toluene	ug/L	ND	20	20	19.0	19.1	95	96	61-140	1	30		
trans-1,2-Dichloroethene	ug/L	ND	20	20	20.6	20.4	103	102	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	ND	20	20	21.1	20.9	106	104	67-134	1	30		
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	51.8	52.0	104	104	30-150	0	30		
Trichloroethene	ug/L	ND	20	20	21.1	21.1	106	105	64-149	0	30		
Trichlorofluoromethane	ug/L	ND	20	20	23.3	22.6	116	113	75-150	3	30		
Vinyl acetate	ug/L	ND	20	20	18.5	18.8	93	94	49-143	1	30		
Vinyl chloride	ug/L	ND	20	20	21.9	21.6	109	108	75-133	1	30		
Xylene (Total)	ug/L	ND	60	60	68.2	67.2	114	112	63-142	1	30		
1,2-Dichloroethane-d4 (S)	%						98	98	75-137				
4-Bromofluorobenzene (S)	%						102	102	75-125				
Toluene-d8 (S)	%						101	100	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391007

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391007001	MW12S-GW-053117	EPA 8260B	478331		
10391007002	MW11S-GW-053117	EPA 8260B	478331		
10391007003	MW10S-GW-053117	EPA 8260B	478331		
10391007004	MW13S-GW-053117	EPA 8260B	478331		
10391007005	MW7S-GW-053117	EPA 8260B	478331		
10391007006	Trip Blank	EPA 8260B	478331		

### REPORT OF LABORATORY ANALYSIS

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**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M

Project #:

**WO# : 10391007**



10391007

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_

Tracking Number: 7096 3373 3679

Custody Seal on Cooler/Box Present?  Yes     No    Seals Intact?  Yes     No    Optional:    Proj. Due Date:    Proj. Name:

Packing Material:  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_    Temp Blank?  Yes     No

Thermometer Used:  151401163     151401164    Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.1    Cooler Temp Corrected (°C): 3.2    Biological Tissue Frozen?  Yes     No     NA

Temp should be above freezing to 6°C    Correction Factor: to .1    Date and Initials of Person Examining Contents: EYL 6/2/17

USDA Regulated Soil  N/A, water sample)    Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>not requested</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed:    Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>11:15</u>	Temp: <u>3.1</u>	Corrected Temp: <u>3.2</u>
Time: <u>11:35</u>	put in cooler	
Time:	Temp:	Corrected Temp:

**Project Manager Review:**

JENNI GROSS

Date: 06/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 21, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

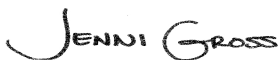
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 08, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391445001	ASHER-GW-060517	Water	06/05/17 16:00	06/08/17 09:45
10391445002	TRIP BLANK-060517	Water	06/05/17 07:00	06/08/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391445001	ASHER-GW-060517	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		EPA 8260B	DJB	83	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391445002	TRIP BLANK-060517	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391445001</b>	<b>ASHER-GW-060517</b>					
RSK 175	Methane	1.9J	ug/L	10.0	06/08/17 14:56	
6010C Met	Barium, Dissolved	86.0	ug/L	10.0	06/16/17 06:18	
6010C Met	Calcium, Dissolved	69100	ug/L	500	06/16/17 06:18	
6010C Met	Cobalt, Dissolved	0.96J	ug/L	10.0	06/16/17 06:18	
6010C Met	Copper, Dissolved	354	ug/L	10.0	06/16/17 06:18	
6010C Met	Lead, Dissolved	2.1J	ug/L	10.0	06/16/17 06:18	
6010C Met	Magnesium, Dissolved	20200	ug/L	500	06/16/17 06:18	
6010C Met	Manganese, Dissolved	0.88J	ug/L	5.0	06/16/17 06:18	
6010C Met	Potassium, Dissolved	1310J	ug/L	2500	06/16/17 06:18	
6010C Met	Sodium, Dissolved	21200	ug/L	1000	06/16/17 06:18	
6010C Met	Thallium, Dissolved	4.8J	ug/L	20.0	06/16/17 06:18	
6010C Met	Vanadium, Dissolved	10.7J	ug/L	15.0	06/16/17 06:18	
6010C Met	Zinc, Dissolved	30.0	ug/L	20.0	06/16/17 06:18	
EPA 8260B	Acetone	30.9	ug/L	20.0	06/15/17 03:53	
SM 2320B	Alkalinity, Total as CaCO3	248	mg/L	5.0	06/14/17 16:51	M1
SM 2540C	Total Dissolved Solids	403	mg/L	10.0	06/12/17 16:20	
SM 4500-S-2 D	Sulfide, Total	0.0071J	mg/L	0.020	06/12/17 13:27	
EPA 300.0	Chloride	10.6	mg/L	1.2	06/09/17 01:54	
EPA 300.0	Nitrate as N	8.1	mg/L	0.20	06/13/17 21:44	H3
EPA 300.0	Sulfate	36.2	mg/L	1.2	06/09/17 01:54	
EPA 353.2	Nitrogen, NO2 plus NO3	8.1	mg/L	0.20	06/09/17 15:19	
SM 5310C	Total Organic Carbon	1.1	mg/L	1.0	06/13/17 17:27	

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Date:** June 21, 2017

Method nitrate+nitrite by 353.2 was analyzed on sample ASHER-GW-060517, per client request on 06/09/17.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 479651

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2612455)
- Tetrahydrofuran

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479651

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479663

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10391341029,10391445001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2612521)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2612522)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 82398

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2055718001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 350517)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.

- ASHER-GW-060517 (Lab ID: 10391445001)

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

**Sample: ASHER-GW-060517**      **Lab ID: 10391445001**      Collected: 06/05/17 16:00      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/08/17 14:56	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/08/17 14:56	74-85-1	
Methane	1.9J	ug/L	10.0	1.1	1		06/08/17 14:56	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 06:18	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:18	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:18	7440-38-2	
Barium, Dissolved	86.0	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 06:18	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 06:18	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 06:18	7440-43-9	
Calcium, Dissolved	69100	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 06:18	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 06:18	7440-47-3	
Cobalt, Dissolved	0.96J	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 06:18	7440-48-4	
Copper, Dissolved	354	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 06:18	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 06:18	7439-89-6	
Lead, Dissolved	2.1J	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 06:18	7439-92-1	
Magnesium, Dissolved	20200	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 06:18	7439-95-4	
Manganese, Dissolved	0.88J	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 06:18	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 06:18	7440-02-0	
Potassium, Dissolved	1310J	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 06:18	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 06:18	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 06:18	7440-22-4	
Sodium, Dissolved	21200	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 06:18	7440-23-5	
Thallium, Dissolved	4.8J	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 06:18	7440-28-0	
Vanadium, Dissolved	10.7J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 06:18	7440-62-2	
Zinc, Dissolved	30.0	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 06:18	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 15:17	7439-97-6	
<b>8260B MSV Low Level</b> Analytical Method: EPA 8260B									
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 03:53	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 03:53	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 03:53	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 03:53	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 03:53	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 03:53	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 03:53	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 03:53	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 03:53	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 03:53	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 03:53	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 03:53	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 03:53	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 03:53	106-93-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

Sample: ASHER-GW-060517 Lab ID: 10391445001 Collected: 06/05/17 16:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 03:53	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 03:53	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 03:53	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 03:53	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 03:53	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 03:53	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 03:53	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 03:53	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 03:53	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 03:53	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 03:53	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 03:53	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 03:53	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 03:53	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 03:53	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 03:53	108-10-1	
Acetone	30.9	ug/L	20.0	0.64	1		06/15/17 03:53	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 03:53	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 03:53	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 03:53	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 03:53	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 03:53	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 03:53	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 03:53	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 03:53	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 03:53	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 03:53	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 03:53	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 03:53	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 03:53	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 03:53	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 03:53	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 03:53	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 03:53	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 03:53	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 03:53	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 03:53	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 03:53	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 03:53	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 03:53	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 03:53	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 03:53	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 03:53	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 03:53	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 03:53	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 03:53	109-99-9	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

Sample: ASHER-GW-060517 Lab ID: 10391445001 Collected: 06/05/17 16:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b> Analytical Method: EPA 8260B									
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 03:53	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 03:53	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 03:53	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 03:53	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 03:53	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 03:53	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 03:53	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 03:53	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 03:53	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 03:53	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 03:53	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 03:53	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 03:53	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 03:53	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 03:53	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 03:53	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 03:53	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 03:53	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 03:53	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 03:53	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		06/15/17 03:53	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1		06/15/17 03:53	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		06/15/17 03:53	460-00-4	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	248	mg/L	5.0	1.4	1		06/14/17 16:51		M1
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	403	mg/L	10.0	5.0	1		06/12/17 16:20		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0071J	mg/L	0.020	0.0050	1		06/12/17 13:27	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	10.6	mg/L	1.2	0.10	1		06/09/17 01:54	16887-00-6	
Nitrate as N	8.1	mg/L	0.20	0.026	2		06/13/17 21:44	14797-55-8	H3
Sulfate	36.2	mg/L	1.2	0.16	1		06/09/17 01:54	14808-79-8	
<b>353.2 Nitrate + Nitrite</b> Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	8.1	mg/L	0.20	0.075	10		06/09/17 15:19		
<b>410.4 COD</b> Analytical Method: EPA 410.4 Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:45		

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

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**Sample: ASHER-GW-060517**      **Lab ID: 10391445001**      Collected: 06/05/17 16:00      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	1.1	mg/L	1.0	0.20	1		06/13/17 17:27	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

Sample: **TRIP BLANK-060517** Lab ID: **10391445002** Collected: 06/05/17 07:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 00:36	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 00:36	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 00:36	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 00:36	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 00:36	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 00:36	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 00:36	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 00:36	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 00:36	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 00:36	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 00:36	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 00:36	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 00:36	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 00:36	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 00:36	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 00:36	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 00:36	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 00:36	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 00:36	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 00:36	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 00:36	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 00:36	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 00:36	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 00:36	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 00:36	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 00:36	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 00:36	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 00:36	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 00:36	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 00:36	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/15/17 00:36	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 00:36	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 00:36	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 00:36	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 00:36	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 00:36	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 00:36	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 00:36	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 00:36	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 00:36	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 00:36	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 00:36	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 00:36	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 00:36	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 00:36	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 00:36	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

**Sample: TRIP BLANK-060517**      **Lab ID: 10391445002**      Collected: 06/05/17 07:00      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 00:36	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 00:36	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 00:36	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 00:36	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 00:36	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 00:36	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 00:36	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 00:36	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 00:36	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 00:36	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 00:36	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 00:36	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 00:36	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 00:36	109-99-9	
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 00:36	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 00:36	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 00:36	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 00:36	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 00:36	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 00:36	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 00:36	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 00:36	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 00:36	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 00:36	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 00:36	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 00:36	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 00:36	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 00:36	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 00:36	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 00:36	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 00:36	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 00:36	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 00:36	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 00:36	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		06/15/17 00:36	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/15/17 00:36	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		06/15/17 00:36	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 478691 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10391445001

METHOD BLANK: 2608000 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/08/17 13:50	
Ethene	ug/L	<0.68	10.0	0.68	06/08/17 13:50	
Methane	ug/L	1.4J	10.0	1.1	06/08/17 13:50	

LABORATORY CONTROL SAMPLE & LCSD: 2608001

Parameter	Units	2608002								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	117	110	103	97	85-115	7	20	
Ethene	ug/L	106	110	104	104	98	85-115	6	20	
Methane	ug/L	60.7	61.8	57.8	102	95	85-115	7	20	

SAMPLE DUPLICATE: 2608003

Parameter	Units	10391445001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.9J	1.8J		20	

SAMPLE DUPLICATE: 2608004

Parameter	Units	10391449002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	2.2J	1.7J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

QC Batch: 479083

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10391445001

METHOD BLANK: 2610059

Matrix: Water

Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/20/17 15:13	

LABORATORY CONTROL SAMPLE: 2610060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610061 2610062

Parameter	Units	2610061		2610062		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Mercury, Dissolved	ug/L	<0.062	5	5	4.2	4.6	85	92	80-120	8	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 479075 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10391445001

METHOD BLANK: 2610031 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/16/17 06:12	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/16/17 06:12	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/16/17 06:12	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/16/17 06:12	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/16/17 06:12	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/16/17 06:12	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/16/17 06:12	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/16/17 06:12	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/16/17 06:12	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/16/17 06:12	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/16/17 06:12	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/16/17 06:12	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/16/17 06:12	
Potassium, Dissolved	ug/L	71.3J	2500	26.1	06/16/17 06:12	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/16/17 06:12	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/16/17 06:12	
Sodium, Dissolved	ug/L	27.8J	1000	12.0	06/16/17 06:12	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/16/17 06:12	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/16/17 06:12	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/16/17 06:12	

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	991	99	80-120	
Arsenic, Dissolved	ug/L	1000	1010	101	80-120	
Barium, Dissolved	ug/L	1000	992	99	80-120	
Beryllium, Dissolved	ug/L	1000	1000	100	80-120	
Cadmium, Dissolved	ug/L	1000	991	99	80-120	
Calcium, Dissolved	ug/L	20000	19000	95	80-120	
Chromium, Dissolved	ug/L	1000	979	98	80-120	
Cobalt, Dissolved	ug/L	1000	981	98	80-120	
Copper, Dissolved	ug/L	1000	972	97	80-120	
Iron, Dissolved	ug/L	20000	19600	98	80-120	
Lead, Dissolved	ug/L	1000	994	99	80-120	
Magnesium, Dissolved	ug/L	20000	19500	98	80-120	
Manganese, Dissolved	ug/L	1000	994	99	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	987	99	80-120	
Potassium, Dissolved	ug/L	20000	19100	96	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	485	97	80-120	
Sodium, Dissolved	ug/L	20000	18800	94	80-120	
Thallium, Dissolved	ug/L	1000	982	98	80-120	
Vanadium, Dissolved	ug/L	1000	955	96	80-120	
Zinc, Dissolved	ug/L	1000	986	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610033 2610034

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10391445001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	<13.5	20000	20000	20400	20700	102	103	75-125	1	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1000	1000	100	100	75-125	0	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1010	1020	101	102	75-125	1	20	
Barium, Dissolved	ug/L	86.0	1000	1000	1060	1070	97	98	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1000	1010	100	101	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	977	989	98	99	75-125	1	20	
Calcium, Dissolved	ug/L	69100	20000	20000	88200	89000	95	99	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	963	973	96	97	75-125	1	20	
Cobalt, Dissolved	ug/L	0.96J	1000	1000	943	958	94	96	75-125	2	20	
Copper, Dissolved	ug/L	354	1000	1000	1320	1340	97	99	75-125	1	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	19300	19400	96	97	75-125	1	20	
Lead, Dissolved	ug/L	2.1J	1000	1000	967	979	97	98	75-125	1	20	
Magnesium, Dissolved	ug/L	20200	20000	20000	39700	40100	98	100	75-125	1	20	
Manganese, Dissolved	ug/L	0.88J	1000	1000	971	983	97	98	75-125	1	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	945	955	94	95	75-125	1	20	
Potassium, Dissolved	ug/L	1310J	20000	20000	20900	21200	98	99	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1030	1050	103	105	75-125	1	20	
Silver, Dissolved	ug/L	<0.28	500	500	481	486	96	97	75-125	1	20	
Sodium, Dissolved	ug/L	21200	20000	20000	40600	40700	97	97	75-125	0	20	
Thallium, Dissolved	ug/L	4.8J	1000	1000	959	970	95	97	75-125	1	20	
Vanadium, Dissolved	ug/L	10.7J	1000	1000	956	967	95	96	75-125	1	20	
Zinc, Dissolved	ug/L	30.0	1000	1000	974	987	94	96	75-125	1	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

QC Batch: 479651 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391445001, 10391445002

METHOD BLANK: 2612454 Matrix: Water

Associated Lab Samples: 10391445001, 10391445002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/14/17 23:08	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/14/17 23:08	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/14/17 23:08	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/14/17 23:08	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/14/17 23:08	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/14/17 23:08	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/14/17 23:08	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/14/17 23:08	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/14/17 23:08	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/14/17 23:08	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/14/17 23:08	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/14/17 23:08	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/14/17 23:08	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/14/17 23:08	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/14/17 23:08	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/14/17 23:08	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/14/17 23:08	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/14/17 23:08	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/14/17 23:08	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/14/17 23:08	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/14/17 23:08	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/14/17 23:08	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/14/17 23:08	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/14/17 23:08	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/14/17 23:08	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/14/17 23:08	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/14/17 23:08	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/14/17 23:08	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/14/17 23:08	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/14/17 23:08	
Acetone	ug/L	<0.64	20.0	0.64	06/14/17 23:08	
Acrolein	ug/L	<2.1	10.0	2.1	06/14/17 23:08	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/14/17 23:08	
Benzene	ug/L	<0.042	0.50	0.042	06/14/17 23:08	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/14/17 23:08	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/14/17 23:08	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/14/17 23:08	
Bromoform	ug/L	<0.11	4.0	0.11	06/14/17 23:08	
Bromomethane	ug/L	<0.20	4.0	0.20	06/14/17 23:08	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/14/17 23:08	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/14/17 23:08	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

METHOD BLANK: 2612454 Matrix: Water

Associated Lab Samples: 10391445001, 10391445002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/14/17 23:08	
Chloroethane	ug/L	<0.12	1.0	0.12	06/14/17 23:08	
Chloroform	ug/L	<0.21	1.0	0.21	06/14/17 23:08	
Chloromethane	ug/L	<0.080	4.0	0.080	06/14/17 23:08	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/14/17 23:08	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/14/17 23:08	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/14/17 23:08	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/14/17 23:08	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/14/17 23:08	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/14/17 23:08	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/14/17 23:08	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/14/17 23:08	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/14/17 23:08	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/14/17 23:08	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/14/17 23:08	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/14/17 23:08	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/14/17 23:08	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/14/17 23:08	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/14/17 23:08	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/14/17 23:08	
Naphthalene	ug/L	<0.064	1.0	0.064	06/14/17 23:08	
o-Xylene	ug/L	<0.044	0.50	0.044	06/14/17 23:08	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/14/17 23:08	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/14/17 23:08	
Styrene	ug/L	<0.056	0.50	0.056	06/14/17 23:08	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/14/17 23:08	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/14/17 23:08	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/14/17 23:08	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/14/17 23:08	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/14/17 23:08	
Toluene	ug/L	<0.059	1.0	0.059	06/14/17 23:08	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/14/17 23:08	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/14/17 23:08	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/14/17 23:08	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/14/17 23:08	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/14/17 23:08	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/14/17 23:08	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/14/17 23:08	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/14/17 23:08	
1,2-Dichloroethane-d4 (S)	%	97	75-137		06/14/17 23:08	
4-Bromofluorobenzene (S)	%	100	75-125		06/14/17 23:08	
Toluene-d8 (S)	%	97	75-125		06/14/17 23:08	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

LABORATORY CONTROL SAMPLE & LCSD: 2612455		2612456									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	22.3	22.0	112	110	75-136	2	30		
1,1,1-Trichloroethane	ug/L	20	22.3	21.3	111	107	75-129	5	30		
1,1,2,2-Tetrachloroethane	ug/L	20	19.8	19.6	99	98	71-138	1	30		
1,1,2-Trichloroethane	ug/L	20	19.4	19.2	97	96	75-125	1	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.9	21.1	109	105	69-126	4	30		
1,1-Dichloroethane	ug/L	20	21.2	20.7	106	104	75-125	2	30		
1,1-Dichloroethene	ug/L	20	21.2	20.7	106	104	75-125	2	30		
1,1-Dichloropropene	ug/L	20	21.8	20.7	109	103	75-125	5	30		
1,2,3-Trichlorobenzene	ug/L	20	19.2	20.4	96	102	75-125	6	30		
1,2,3-Trichloropropane	ug/L	20	20.1	20.7	101	103	75-125	3	30		
1,2,4-Trichlorobenzene	ug/L	20	19.2	20.0	96	100	75-125	4	30		
1,2,4-Trimethylbenzene	ug/L	20	19.4	19.2	97	96	75-125	1	30		
1,2-Dibromo-3-chloropropane	ug/L	50	50.1	50.2	100	100	71-130	0	30		
1,2-Dibromoethane (EDB)	ug/L	20	21.6	21.0	108	105	75-125	3	30		
1,2-Dichlorobenzene	ug/L	20	21.3	21.5	107	108	75-125	1	30		
1,2-Dichloroethane	ug/L	20	20.0	19.9	100	99	70-125	1	30		
1,2-Dichloroethene (Total)	ug/L	40	42.3	41.2	106	103	75-125	2	30		
1,2-Dichloropropane	ug/L	20	20.5	20.0	103	100	75-125	3	30		
1,3,5-Trimethylbenzene	ug/L	20	20.8	20.7	104	103	75-125	0	30		
1,3-Dichlorobenzene	ug/L	20	20.6	20.3	103	102	75-125	1	30		
1,3-Dichloropropane	ug/L	20	21.0	20.6	105	103	75-125	2	30		
1,4-Dichlorobenzene	ug/L	20	20.1	20.1	101	100	75-125	0	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	424	381	106	95	64-140	11	30		
2,2,4-Trimethylpentane	ug/L	20	19.6	18.7	98	94	68-125	5	30		
2,2-Dichloropropane	ug/L	20	21.6	20.9	108	105	70-131	3	30		
2-Butanone (MEK)	ug/L	100	96.9	93.3	97	93	69-125	4	30		
2-Chlorotoluene	ug/L	20	20.3	20.4	102	102	75-125	0	30		
2-Hexanone	ug/L	100	105	102	105	102	73-129	3	30		
4-Chlorotoluene	ug/L	20	20.5	20.5	102	102	75-125	0	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	100	103	100	73-125	3	30		
Acetone	ug/L	100	118	112	118	112	66-126	6	30		
Acrolein	ug/L	200	223	221	112	110	56-150	1	30		
Acrylonitrile	ug/L	200	208	200	104	100	68-129	4	30		
Benzene	ug/L	20	19.7	19.0	98	95	75-125	3	30		
Bromobenzene	ug/L	20	20.5	20.4	102	102	75-125	0	30		
Bromochloromethane	ug/L	20	22.7	22.1	113	110	75-126	3	30		
Bromodichloromethane	ug/L	20	21.5	21.2	107	106	75-133	1	30		
Bromoform	ug/L	20	20.5	20.9	103	105	62-142	2	30		
Bromomethane	ug/L	20	17.9	20.6	89	103	34-143	14	30		
Carbon disulfide	ug/L	20	20.5	20.1	102	100	71-125	2	30		
Carbon tetrachloride	ug/L	20	24.4	23.6	122	118	71-145	3	30		
Chlorobenzene	ug/L	20	20.8	20.0	104	100	75-125	4	30		
Chloroethane	ug/L	20	21.5	21.1	107	106	75-125	2	30		
Chloroform	ug/L	20	21.2	20.6	106	103	75-125	3	30		
Chloromethane	ug/L	20	19.8	19.7	99	98	54-125	1	30		
cis-1,2-Dichloroethene	ug/L	20	21.4	20.9	107	104	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	20	20.2	20.0	101	100	75-125	1	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

LABORATORY CONTROL SAMPLE & LCSD:		2612455		2612456							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	21.0	20.4	105	102	74-141	3	30		
Dibromomethane	ug/L	20	23.2	23.1	116	115	75-125	0	30		
Dichlorodifluoromethane	ug/L	20	19.4	18.8	97	94	59-130	3	30		
Dichlorofluoromethane	ug/L	20	21.3	21.1	107	106	75-125	1	30		
Diisopropyl ether	ug/L	20	20.5	20.5	103	102	69-125	0	30		
Ethyl-tert-butyl ether	ug/L	20	21.5	21.5	108	108	73-125	0	30		
Ethylbenzene	ug/L	20	20.4	19.7	102	98	75-125	4	30		
Hexachloro-1,3-butadiene	ug/L	20	22.4	22.3	112	112	75-131	0	30		
Isopropylbenzene (Cumene)	ug/L	20	21.8	21.2	109	106	75-125	3	30		
m&p-Xylene	ug/L	40	43.2	42.0	108	105	75-125	3	30		
Methyl-tert-butyl ether	ug/L	20	21.2	21.0	106	105	75-125	1	30		
Methylene Chloride	ug/L	20	19.5	19.4	98	97	73-125	0	30		
n-Butylbenzene	ug/L	20	20.7	20.1	103	100	75-125	3	30		
n-Propylbenzene	ug/L	20	19.7	19.5	98	98	75-125	1	30		
Naphthalene	ug/L	20	18.0	18.7	90	94	74-125	4	30		
o-Xylene	ug/L	20	22.4	21.4	112	107	75-125	5	30		
p-Isopropyltoluene	ug/L	20	20.0	19.6	100	98	75-125	2	30		
sec-Butylbenzene	ug/L	20	20.8	20.8	104	104	75-125	0	30		
Styrene	ug/L	20	20.2	19.6	101	98	75-125	3	30		
tert-Amylmethyl ether	ug/L	20	20.0	20.2	100	101	71-126	1	30		
tert-Butyl Alcohol	ug/L	200	222	214	111	107	69-131	4	30		
tert-Butylbenzene	ug/L	20	20.7	20.5	103	102	75-125	1	30		
Tetrachloroethene	ug/L	20	21.2	20.5	106	102	75-125	3	30		
Tetrahydrofuran	ug/L	200	266	243	133	121	65-127	9	30	L3	
Toluene	ug/L	20	18.2	17.5	91	87	75-125	4	30		
trans-1,2-Dichloroethene	ug/L	20	20.9	20.4	104	102	75-125	3	30		
trans-1,3-Dichloropropene	ug/L	20	20.7	20.5	103	103	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	47.5	47.8	95	96	30-150	1	30		
Trichloroethene	ug/L	20	21.0	20.5	105	103	75-125	2	30		
Trichlorofluoromethane	ug/L	20	22.7	22.0	113	110	71-140	3	30		
Vinyl acetate	ug/L	20	21.0	21.1	105	106	68-137	0	30		
Vinyl chloride	ug/L	20	20.4	20.7	102	104	70-125	1	30		
Xylene (Total)	ug/L	60	65.6	63.4	109	106	75-125	3	30		
1,2-Dichloroethane-d4 (S)	%				94	94	75-137				
4-Bromofluorobenzene (S)	%				96	98	75-125				
Toluene-d8 (S)	%				96	97	75-125				

MATRIX SPIKE SAMPLE:		2612457							
Parameter	Units	10392081001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers		
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	23.0	115	75-137			
1,1,1-Trichloroethane	ug/L	<0.057	20	22.9	115	75-139			
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	19.0	95	60-142			
1,1,2-Trichloroethane	ug/L	<0.064	20	19.0	95	75-128			
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	25.8	129	62-150			

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

MATRIX SPIKE SAMPLE: 2612457		10392081001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.055	20	21.9	109	70-129	
1,1-Dichloroethene	ug/L	<0.069	20	23.4	117	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	22.5	112	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	19.7	98	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	19.7	98	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20.0	100	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	19.3	97	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	47.9	96	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	21.1	106	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	21.1	106	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	19.9	99	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.16	40	44.0	110	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	20.9	105	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	21.0	105	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	20.3	101	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	21.2	106	67-128	
1,4-Dichlorobenzene	ug/L	<0.081	20	19.6	98	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	405	101	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	23.5	117	48-150	
2,2-Dichloropropane	ug/L	<0.096	20	22.8	114	50-150	
2-Butanone (MEK)	ug/L	<1.1	100	86.6	87	58-125	
2-Chlorotoluene	ug/L	<0.084	20	20.4	102	65-138	
2-Hexanone	ug/L	<0.19	100	99.5	100	61-134	
4-Chlorotoluene	ug/L	<0.048	20	20.4	102	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	97.6	98	61-130	
Acetone	ug/L	10.9J	100	184	173	51-140	M1
Acrolein	ug/L	<2.1	200	250	125	48-150	
Acrylonitrile	ug/L	<0.49	200	198	99	55-134	
Benzene	ug/L	<0.042	20	20.3	101	63-132	
Bromobenzene	ug/L	<0.087	20	20.5	102	67-138	
Bromochloromethane	ug/L	<0.082	20	22.3	111	66-138	
Bromodichloromethane	ug/L	<0.068	20	21.5	107	75-137	
Bromoform	ug/L	<0.11	20	20.9	104	65-129	
Bromomethane	ug/L	<0.20	20	23.6	118	41-150	
Carbon disulfide	ug/L	<0.20	20	22.1	111	72-132	
Carbon tetrachloride	ug/L	<0.079	20	26.0	130	75-150	
Chlorobenzene	ug/L	<0.066	20	21.2	106	73-127	
Chloroethane	ug/L	<0.12	20	22.9	114	74-138	
Chloroform	ug/L	<0.21	20	21.4	107	74-125	
Chloromethane	ug/L	<0.080	20	21.8	109	58-129	
cis-1,2-Dichloroethene	ug/L	<0.12	20	21.8	109	63-135	
cis-1,3-Dichloropropene	ug/L	<0.069	20	20.1	100	66-129	
Dibromochloromethane	ug/L	<0.048	20	21.0	105	75-133	
Dibromomethane	ug/L	<0.14	20	23.4	117	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	23.3	117	72-150	
Dichlorofluoromethane	ug/L	<0.054	20	22.9	115	75-129	
Diisopropyl ether	ug/L	<0.050	20	20.9	105	62-128	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

MATRIX SPIKE SAMPLE: 2612457		10392081001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	21.5	107	63-132	
Ethylbenzene	ug/L	<0.075	20	20.6	103	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	23.7	118	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	22.4	112	70-136	
m&p-Xylene	ug/L	<0.11	40	44.0	110	64-142	
Methyl-tert-butyl ether	ug/L	<0.047	20	21.0	105	72-125	
Methylene Chloride	ug/L	<0.097	20	20.0	100	60-132	
n-Butylbenzene	ug/L	<0.16	20	21.0	105	60-150	
n-Propylbenzene	ug/L	<0.049	20	20.0	100	63-142	
Naphthalene	ug/L	<0.064	20	17.9	90	67-125	
o-Xylene	ug/L	<0.044	20	22.6	113	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	20.1	101	64-146	
sec-Butylbenzene	ug/L	<0.094	20	21.4	107	67-144	
Styrene	ug/L	<0.056	20	19.9	99	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	19.9	100	60-134	
tert-Butyl Alcohol	ug/L	<0.89	200	223	111	56-146	
tert-Butylbenzene	ug/L	<0.051	20	21.3	107	68-135	
Tetrachloroethene	ug/L	<0.13	20	21.8	109	67-148	
Tetrahydrofuran	ug/L	<1.5	200	368	184	51-141 MO	
Toluene	ug/L	<0.059	20	18.4	92	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	22.2	111	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20.5	102	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	46.7	93	30-150	
Trichloroethene	ug/L	<0.044	20	21.7	109	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	25.8	129	75-150	
Vinyl acetate	ug/L	<0.12	20	19.9	100	49-143	
Vinyl chloride	ug/L	<0.098	20	23.8	119	75-133	
Xylene (Total)	ug/L	<0.15	60	66.6	111	63-142	
1,2-Dichloroethane-d4 (S)	%				93	75-137	
4-Bromofluorobenzene (S)	%				97	75-125	
Toluene-d8 (S)	%				96	75-125	

SAMPLE DUPLICATE: 2612458

Parameter	Units	10392081004	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

SAMPLE DUPLICATE: 2612458

Parameter	Units	10392081004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	<0.16	<0.16		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	<1.1	<1.1		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	7.7J	5.6J		30	
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	0.63J	0.57J		30	
Carbon tetrachloride	ug/L	175	169	3	30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	10.3	9.8	6	30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

SAMPLE DUPLICATE: 2612458

Parameter	Units	10392081004 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	<0.064	<0.064		30	
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	0.081J	0.097J		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	99	98	1		
4-Bromofluorobenzene (S)	%	98	97	1		
Toluene-d8 (S)	%	98	96	2		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 479663 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10391445001

METHOD BLANK: 2612516 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/14/17 15:01	

LABORATORY CONTROL SAMPLE & LCSD: 2612517 2612518

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	42.7	41.7	107	104	90-110	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2612519 2612520

Parameter	Units	10391341029 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	53.2	40	40	93.9	92.7	102	99	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2612521 2612522

Parameter	Units	10391445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	248	40	40	273	266	64	47	80-120	3	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

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QC Batch: 479193                      Analysis Method: SM 2540C  
QC Batch Method: SM 2540C            Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10391445001

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METHOD BLANK: 2610469                      Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/12/17 16:20	

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LABORATORY CONTROL SAMPLE: 2610470

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	928	93	80-120	

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SAMPLE DUPLICATE: 2610471

Parameter	Units	10391507009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	220	215	2	10	

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SAMPLE DUPLICATE: 2610668

Parameter	Units	10391139001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1800	1800	0	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 82398 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10391445001

METHOD BLANK: 350514 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/12/17 13:27	

LABORATORY CONTROL SAMPLE: 350515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	108	90-110	

MATRIX SPIKE SAMPLE: 350517

Parameter	Units	2055718001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.034	16	75-125	M1

SAMPLE DUPLICATE: 350516

Parameter	Units	2055718001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 478791 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10391445001

METHOD BLANK: 2608462 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/09/17 00:08	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/09/17 00:08	
Sulfate	mg/L	<0.16	1.2	0.16	06/09/17 00:08	

LABORATORY CONTROL SAMPLE: 2608463

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.2	106	90-110	
Nitrate as N	mg/L	1	1.1	107	90-110	
Sulfate	mg/L	12.5	13.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608464 2608465

Parameter	Units	10391449002		2608464		2608465		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	2.7	12.5	12.5	15.2	15.1	99	99	90-110	0	20		
Nitrate as N	mg/L	0.14	1	1	1.1	1.1	97	97	90-110	0	20		
Sulfate	mg/L	4.8	12.5	12.5	16.9	16.8	96	96	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 478945 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391445001

METHOD BLANK: 2609246 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/09/17 15:06	

LABORATORY CONTROL SAMPLE: 2609247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609248 2609249

Parameter	Units	10390956001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	17.8	17.1	100	94	90-110	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609250 2609251

Parameter	Units	10391312005	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	0.67	1	1	1.6	1.6	96	93	90-110	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 480302 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10391445001

METHOD BLANK: 2616335 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/19/17 15:43	

LABORATORY CONTROL SAMPLE: 2616336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	288	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616337 2616338

Parameter	Units	10391445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	245	245	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616339 2616340

Parameter	Units	10391446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	237	231	95	92	90-110	3	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

QC Batch: 116289 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10391445001

METHOD BLANK: 459009 Matrix: Water  
Associated Lab Samples: 10391445001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/13/17 14:09	

LABORATORY CONTROL SAMPLE: 459010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 459011 459012

Parameter	Units	10391449001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	0.43J	25	25	25.0	25.3	98	100	80-120	2	20	

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis  
PASI-N Pace Analytical Services - New Orleans  
PASI-V Pace Analytical Services - Virginia

### WORKORDER QUALIFIERS

WO: 10391445  
[1] Method nitrate+nitrite by 353.2 was analyzed on sample ASHER-GW-060517, per client request on 06/09/17.

### BATCH QUALIFIERS

Batch: 479651  
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

H3 Sample was received or analysis requested beyond the recognized method holding time.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391445

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391445


Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391445001	ASHER-GW-060517	RSK 175	478691		
10391445001	ASHER-GW-060517	EPA 3010	479075	6010C Met	479698
10391445001	ASHER-GW-060517	EPA 7470A	479083	EPA 7470A	480231
10391445001	ASHER-GW-060517	EPA 8260B	479651		
10391445002	TRIP BLANK-060517	EPA 8260B	479651		
10391445001	ASHER-GW-060517	SM 2320B	479663		
10391445001	ASHER-GW-060517	SM 2540C	479193		
10391445001	ASHER-GW-060517	SM 4500-S-2 D	82398		
10391445001	ASHER-GW-060517	EPA 300.0	478791		
10391445001	ASHER-GW-060517	EPA 353.2	478945		
10391445001	ASHER-GW-060517	EPA 410.4	480302	EPA 410.4	480347
10391445001	ASHER-GW-060517	SM 5310C	116289		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt - ESI Tech Specs	Client Name: <b>CH2M Hill UPRR</b>	Project #:	WO#: 10391445
Courier: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Commercial <input type="checkbox"/> Pace <input type="checkbox"/> Speedee <input type="checkbox"/> Other:		 10391445	
Tracking Number: <b>7222 2739 9087</b>		Optional: Proj. Due Date: _____ Proj. Name: _____	
Custody Seal on Cooler/Box Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Packing Material: <input checked="" type="checkbox"/> Bubble Wrap <input checked="" type="checkbox"/> Bubble Bags <input type="checkbox"/> None <input type="checkbox"/> Other: _____		Temp Blank? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Thermometer Used: <input checked="" type="checkbox"/> 151401163 <input type="checkbox"/> 151401164		Type of Ice: <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Blue <input type="checkbox"/> None <input type="checkbox"/> Samples on ice, cooling process has begun	
Cooler Temp Read (°C): <b>5.2</b>		Cooler Temp Corrected (°C): <b>5.3</b>	
Temp should be above freezing to 6°C		Biological Tissue Frozen? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
USDA Regulated Soil ( <input checked="" type="checkbox"/> N/A, water sample)		Date and Initials of Person Examining Contents: <b>ME 6-8-17</b>	
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? <input type="checkbox"/> Yes <input type="checkbox"/> No		Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? <input type="checkbox"/> Yes <input type="checkbox"/> No	

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <b>WT</b>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	Sample # <b>1</b> <b>1/1</b> <b>1/1</b> <b>1/1</b>
Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>121210-380F</b>	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Field Data Required?  Yes     No

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <b>1040</b> Temp: <b>5.2</b>	Corrected Temp: <b>5.3</b>
Time: _____ put in cooler	
Time: <b>1050</b> Temp: _____	Corrected Temp: _____

Project Manager Review: JENNI GROSS    Date: 06/08/17

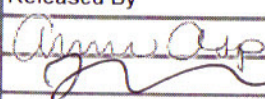
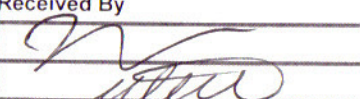
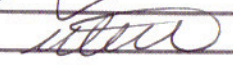
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

**WO#: 1289100**  
 PM: HRZ Due Date: 06/22/17  
 CLIENT: PACE MPLS  
 Page 48 of 51  
 ical  
 bs.com

**Workorder:** 10391445    **Workorder Name:** 1497 UPRR\_Freeman    **Owner Received Date:** 6/8/2017    **Results Requested By:** 6/22/2017

Report To		Subcontract To				Requested Analysis																	
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																					
						Preserved Containers																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other																	LAB USE ONLY
1	ASHER-GW-060517	PS	6/5/2017 16:00	10391445001	Water	3																	X 001
2																							
3																							
4																							
5																							

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	 Pace MN	6/8/17 1250		6/8/17 1840	
2		6/8/17 2230		6-9-17 707S	
3					

**Cooler Temperature on Receipt** 2.2°C    **Custody Seal** Y or N    **Received on Ice** Y or N    **Samples Intact** Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:  
**Sample Condition Upon Receipt Form**

Document No.:  
**F-VM-C-001-Rev.10**

Document Revised: 15Mar2016  
Page 1 of 1

Issuing Authority:  
Pace Virginia, Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: Pace - MIV Project #

**WO#: 1289100**

PM: HRZ Due Date: 06/22/17

CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: 1 x 2 Pcs Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.4 Cooler Temp Corrected °C: 2.2 Biological Tissue Frozen?  Yes  No  NA  
Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: JDL 6/19/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WJ</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 6/19/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

WO#: 2055901



lytical  
scelabs.com

Workorder: 10391445

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/8/2017

Results Requested By: 6/22/2017

Report To		Subcontract To					Requested Analysis														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					5636267 / 4500 Sulfide	LAB USE ONLY									
						H2SO4	NaOH+Zn acetate														
1	ASHER-GW-060517	PS	6/5/2017 16:00	10391445001	Water		1				X										
2																					
3																					
4																					
5																					
Transfers												Comments									
Released By	Date/Time	Received By	Date/Time																		
<i>[Signature]</i> Pace MN	6/8/17 1250	<i>Fed Exp</i>																			
<i>Fed Exp</i>	6/9/17	<i>[Signature]</i>	6/9/17																		
	0930		0930																		
Cooler Temperature on Receipt 2.0 °C		Custody Seal Y or N		Received on Ice Y or N		Samples Intact Y or N															

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Sample Condition Upo

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

WO#: 2055901

PM: ADC

Due Date: 06/22/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/10/17 JMB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	500 Plastic preserved
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

June 21, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

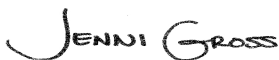
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 08, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification # : 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391446001	LANG-GW-060617	Water	06/06/17 15:50	06/08/17 09:45
10391446002	TRIP BLANK-060617	Water	06/06/17 07:00	06/08/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391446001	LANG-GW-060617	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		EPA 8260B	DJB	83	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391446002	TRIP BLANK-060617	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391446001</b>	<b>LANG-GW-060617</b>					
RSK 175	Methane	6.2J	ug/L	10.0	06/08/17 15:25	
6010C Met	Antimony, Dissolved	2.6J	ug/L	20.0	06/16/17 06:38	
6010C Met	Barium, Dissolved	15.3	ug/L	10.0	06/16/17 06:38	
6010C Met	Calcium, Dissolved	42300	ug/L	500	06/16/17 06:38	
6010C Met	Copper, Dissolved	9.0J	ug/L	10.0	06/16/17 06:38	
6010C Met	Magnesium, Dissolved	12300	ug/L	500	06/16/17 06:38	
6010C Met	Manganese, Dissolved	9.5	ug/L	5.0	06/16/17 06:38	
6010C Met	Potassium, Dissolved	1320J	ug/L	2500	06/16/17 06:38	
6010C Met	Sodium, Dissolved	17100	ug/L	1000	06/16/17 06:38	
6010C Met	Vanadium, Dissolved	5.6J	ug/L	15.0	06/16/17 06:38	
6010C Met	Zinc, Dissolved	75.6	ug/L	20.0	06/16/17 06:38	
EPA 8260B	Acetone	14.4J	ug/L	20.0	06/15/17 17:04	CH,L3
EPA 8260B	Methylene Chloride	0.63J	ug/L	4.0	06/15/17 17:04	
SM 2320B	Alkalinity, Total as CaCO3	185	mg/L	5.0	06/16/17 11:51	
SM 2540C	Total Dissolved Solids	250	mg/L	10.0	06/13/17 12:31	
SM 4500-S-2 D	Sulfide, Total	0.011J	mg/L	0.020	06/12/17 13:27	
EPA 300.0	Chloride	1.8	mg/L	1.2	06/09/17 02:09	
EPA 300.0	Nitrate as N	0.46	mg/L	0.10	06/09/17 02:09	H1
EPA 300.0	Sulfate	2.1	mg/L	1.2	06/09/17 02:09	
EPA 353.2	Nitrogen, NO2 plus NO3	0.50	mg/L	0.020	06/09/17 15:04	
SM 5310C	Total Organic Carbon	0.22J	mg/L	1.0	06/13/17 17:14	
<b>10391446002</b>	<b>TRIP BLANK-060617</b>					
EPA 8260B	Acetone	7.8J	ug/L	20.0	06/15/17 12:42	CH,L3
EPA 8260B	Methylene Chloride	0.44J	ug/L	4.0	06/15/17 12:42	

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

---

**Date:** June 21, 2017

Method nitrate+nitrite by 353.2 was analyzed on sample LANG-GW-060617, per client request on 06/09/17.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 479772

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LANG-GW-060617 (Lab ID: 10391446001)
  - Acetone
- LCS (Lab ID: 2613118)
  - Acetone
  - Tetrahydrofuran
- LCSD (Lab ID: 2613119)
  - Acetone
  - Tetrahydrofuran
- TRIP BLANK-060617 (Lab ID: 10391446002)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 479772

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2613118)
  - Acetone
  - Tetrahydrofuran
- LCSD (Lab ID: 2613119)

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

QC Batch: 479772

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- Acetone
- Tetrahydrofuran

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479772

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 480065

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392001003,10392241001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2614571)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2614572)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 82398

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2055718001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 350517)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- LANG-GW-060617 (Lab ID: 10391446001)

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

**Sample: LANG-GW-060617**      **Lab ID: 10391446001**      Collected: 06/06/17 15:50      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/08/17 15:25	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/08/17 15:25	74-85-1	
Methane	6.2J	ug/L	10.0	1.1	1		06/08/17 15:25	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 06:38	7429-90-5	
Antimony, Dissolved	2.6J	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:38	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:38	7440-38-2	
Barium, Dissolved	15.3	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 06:38	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 06:38	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 06:38	7440-43-9	
Calcium, Dissolved	42300	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 06:38	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 06:38	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 06:38	7440-48-4	
Copper, Dissolved	9.0J	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 06:38	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 06:38	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 06:38	7439-92-1	
Magnesium, Dissolved	12300	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 06:38	7439-95-4	
Manganese, Dissolved	9.5	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 06:38	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 06:38	7440-02-0	
Potassium, Dissolved	1320J	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 06:38	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 06:38	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 06:38	7440-22-4	
Sodium, Dissolved	17100	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 06:38	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 06:38	7440-28-0	
Vanadium, Dissolved	5.6J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 06:38	7440-62-2	
Zinc, Dissolved	75.6	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 06:38	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 15:20	7439-97-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 17:04	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 17:04	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:04	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 17:04	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 17:04	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:04	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 17:04	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 17:04	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 17:04	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 17:04	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 17:04	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 17:04	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 17:04	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 17:04	106-93-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

Sample: **LANG-GW-060617** Lab ID: **10391446001** Collected: 06/06/17 15:50 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 17:04	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 17:04	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 17:04	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 17:04	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 17:04	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 17:04	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 17:04	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 17:04	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 17:04	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 17:04	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 17:04	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 17:04	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 17:04	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 17:04	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 17:04	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 17:04	108-10-1	
Acetone	14.4J	ug/L	20.0	0.64	1		06/15/17 17:04	67-64-1	CH,L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 17:04	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 17:04	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 17:04	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 17:04	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 17:04	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 17:04	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 17:04	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 17:04	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 17:04	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 17:04	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 17:04	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 17:04	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 17:04	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 17:04	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 17:04	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 17:04	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 17:04	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 17:04	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 17:04	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 17:04	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 17:04	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 17:04	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 17:04	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 17:04	1634-04-4	
Methylene Chloride	0.63J	ug/L	4.0	0.097	1		06/15/17 17:04	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 17:04	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 17:04	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 17:04	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 17:04	109-99-9	L3

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

**Sample: LANG-GW-060617**      **Lab ID: 10391446001**      Collected: 06/06/17 15:50      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 17:04	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 17:04	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:04	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 17:04	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 17:04	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 17:04	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 17:04	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 17:04	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 17:04	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 17:04	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 17:04	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 17:04	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 17:04	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 17:04	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 17:04	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 17:04	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 17:04	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 17:04	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 17:04	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 17:04	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		06/15/17 17:04	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/15/17 17:04	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		06/15/17 17:04	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	185	mg/L	5.0	1.4	1		06/16/17 11:51		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	250	mg/L	10.0	5.0	1		06/13/17 12:31		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	0.011J	mg/L	0.020	0.0050	1		06/12/17 13:27	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.8	mg/L	1.2	0.10	1		06/09/17 02:09	16887-00-6	
Nitrate as N	0.46	mg/L	0.10	0.013	1		06/09/17 02:09	14797-55-8	H1
Sulfate	2.1	mg/L	1.2	0.16	1		06/09/17 02:09	14808-79-8	
<b>353.2 Nitrate + Nitrite</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	0.50	mg/L	0.020	0.0075	1		06/09/17 15:04		
<b>410.4 COD</b>		Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:46		

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

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**Sample: LANG-GW-060617**      **Lab ID: 10391446001**      Collected: 06/06/17 15:50      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.22J</b>	mg/L	1.0	0.20	1		06/13/17 17:14	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

Sample: **TRIP BLANK-060617** Lab ID: **10391446002** Collected: 06/06/17 07:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 12:42	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 12:42	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 12:42	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 12:42	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 12:42	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 12:42	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 12:42	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 12:42	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 12:42	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 12:42	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 12:42	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 12:42	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 12:42	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 12:42	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 12:42	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 12:42	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 12:42	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 12:42	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 12:42	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 12:42	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 12:42	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 12:42	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 12:42	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 12:42	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 12:42	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 12:42	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 12:42	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 12:42	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 12:42	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 12:42	108-10-1	
Acetone	7.8J	ug/L	20.0	0.64	1		06/15/17 12:42	67-64-1	CH,L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 12:42	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 12:42	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 12:42	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 12:42	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 12:42	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 12:42	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 12:42	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 12:42	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 12:42	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 12:42	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 12:42	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 12:42	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 12:42	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 12:42	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 12:42	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

**Sample: TRIP BLANK-060617**      **Lab ID: 10391446002**      Collected: 06/06/17 07:00      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 12:42	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 12:42	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 12:42	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 12:42	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 12:42	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 12:42	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 12:42	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 12:42	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 12:42	1634-04-4	
Methylene Chloride	0.44J	ug/L	4.0	0.097	1		06/15/17 12:42	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 12:42	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 12:42	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 12:42	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 12:42	109-99-9	L3
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 12:42	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 12:42	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 12:42	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 12:42	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 12:42	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 12:42	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 12:42	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 12:42	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 12:42	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 12:42	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 12:42	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 12:42	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 12:42	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 12:42	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 12:42	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 12:42	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 12:42	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 12:42	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 12:42	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 12:42	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		06/15/17 12:42	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/15/17 12:42	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		06/15/17 12:42	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 478691 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10391446001

METHOD BLANK: 2608000 Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/08/17 13:50	
Ethene	ug/L	<0.68	10.0	0.68	06/08/17 13:50	
Methane	ug/L	1.4J	10.0	1.1	06/08/17 13:50	

LABORATORY CONTROL SAMPLE & LCSD: 2608001

Parameter	Units	2608002								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	117	110	103	97	85-115	7	20	
Ethene	ug/L	106	110	104	104	98	85-115	6	20	
Methane	ug/L	60.7	61.8	57.8	102	95	85-115	7	20	

SAMPLE DUPLICATE: 2608003

Parameter	Units	10391445001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.9J	1.8J		20	

SAMPLE DUPLICATE: 2608004

Parameter	Units	10391449002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	2.2J	1.7J		20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

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QC Batch: 479083	Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A	Analysis Description: 7470A Mercury Water Dissolved
Associated Lab Samples: 10391446001	

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METHOD BLANK: 2610059 Matrix: Water

Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/20/17 15:13	

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LABORATORY CONTROL SAMPLE: 2610060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	95	80-120	

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MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610061 2610062

Parameter	Units	2610061		2610062		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury, Dissolved	ug/L	<0.062	5	5	4.2	4.6	85	92	80-120	8	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 479075 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10391446001

METHOD BLANK: 2610031 Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/16/17 06:12	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/16/17 06:12	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/16/17 06:12	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/16/17 06:12	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/16/17 06:12	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/16/17 06:12	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/16/17 06:12	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/16/17 06:12	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/16/17 06:12	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/16/17 06:12	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/16/17 06:12	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/16/17 06:12	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/16/17 06:12	
Potassium, Dissolved	ug/L	71.3J	2500	26.1	06/16/17 06:12	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/16/17 06:12	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/16/17 06:12	
Sodium, Dissolved	ug/L	27.8J	1000	12.0	06/16/17 06:12	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/16/17 06:12	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/16/17 06:12	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/16/17 06:12	

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	991	99	80-120	
Arsenic, Dissolved	ug/L	1000	1010	101	80-120	
Barium, Dissolved	ug/L	1000	992	99	80-120	
Beryllium, Dissolved	ug/L	1000	1000	100	80-120	
Cadmium, Dissolved	ug/L	1000	991	99	80-120	
Calcium, Dissolved	ug/L	20000	19000	95	80-120	
Chromium, Dissolved	ug/L	1000	979	98	80-120	
Cobalt, Dissolved	ug/L	1000	981	98	80-120	
Copper, Dissolved	ug/L	1000	972	97	80-120	
Iron, Dissolved	ug/L	20000	19600	98	80-120	
Lead, Dissolved	ug/L	1000	994	99	80-120	
Magnesium, Dissolved	ug/L	20000	19500	98	80-120	
Manganese, Dissolved	ug/L	1000	994	99	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	987	99	80-120	
Potassium, Dissolved	ug/L	20000	19100	96	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	485	97	80-120	
Sodium, Dissolved	ug/L	20000	18800	94	80-120	
Thallium, Dissolved	ug/L	1000	982	98	80-120	
Vanadium, Dissolved	ug/L	1000	955	96	80-120	
Zinc, Dissolved	ug/L	1000	986	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610033 2610034

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10391445001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	<13.5	20000	20000	20400	20700	102	103	75-125	1	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1000	1000	100	100	75-125	0	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1010	1020	101	102	75-125	1	20	
Barium, Dissolved	ug/L	86.0	1000	1000	1060	1070	97	98	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1000	1010	100	101	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	977	989	98	99	75-125	1	20	
Calcium, Dissolved	ug/L	69100	20000	20000	88200	89000	95	99	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	963	973	96	97	75-125	1	20	
Cobalt, Dissolved	ug/L	0.96J	1000	1000	943	958	94	96	75-125	2	20	
Copper, Dissolved	ug/L	354	1000	1000	1320	1340	97	99	75-125	1	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	19300	19400	96	97	75-125	1	20	
Lead, Dissolved	ug/L	2.1J	1000	1000	967	979	97	98	75-125	1	20	
Magnesium, Dissolved	ug/L	20200	20000	20000	39700	40100	98	100	75-125	1	20	
Manganese, Dissolved	ug/L	0.88J	1000	1000	971	983	97	98	75-125	1	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	945	955	94	95	75-125	1	20	
Potassium, Dissolved	ug/L	1310J	20000	20000	20900	21200	98	99	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1030	1050	103	105	75-125	1	20	
Silver, Dissolved	ug/L	<0.28	500	500	481	486	96	97	75-125	1	20	
Sodium, Dissolved	ug/L	21200	20000	20000	40600	40700	97	97	75-125	0	20	
Thallium, Dissolved	ug/L	4.8J	1000	1000	959	970	95	97	75-125	1	20	
Vanadium, Dissolved	ug/L	10.7J	1000	1000	956	967	95	96	75-125	1	20	
Zinc, Dissolved	ug/L	30.0	1000	1000	974	987	94	96	75-125	1	20	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

QC Batch: 479772      Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B      Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10391446001, 10391446002

METHOD BLANK: 2613117      Matrix: Water

Associated Lab Samples: 10391446001, 10391446002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/15/17 10:53	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/15/17 10:53	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/15/17 10:53	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/15/17 10:53	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/15/17 10:53	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/15/17 10:53	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/15/17 10:53	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/15/17 10:53	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/15/17 10:53	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/15/17 10:53	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/15/17 10:53	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/15/17 10:53	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/15/17 10:53	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/15/17 10:53	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/15/17 10:53	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/15/17 10:53	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/15/17 10:53	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/15/17 10:53	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/15/17 10:53	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/15/17 10:53	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/15/17 10:53	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/15/17 10:53	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/15/17 10:53	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/15/17 10:53	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/15/17 10:53	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/15/17 10:53	
Acetone	ug/L	<0.64	20.0	0.64	06/15/17 10:53	
Acrolein	ug/L	<2.1	10.0	2.1	06/15/17 10:53	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/15/17 10:53	
Benzene	ug/L	<0.042	0.50	0.042	06/15/17 10:53	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/15/17 10:53	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/15/17 10:53	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/15/17 10:53	
Bromoform	ug/L	<0.11	4.0	0.11	06/15/17 10:53	
Bromomethane	ug/L	<0.20	4.0	0.20	06/15/17 10:53	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/15/17 10:53	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/15/17 10:53	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

METHOD BLANK: 2613117 Matrix: Water  
Associated Lab Samples: 10391446001, 10391446002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/15/17 10:53	
Chloroethane	ug/L	<0.12	1.0	0.12	06/15/17 10:53	
Chloroform	ug/L	<0.21	1.0	0.21	06/15/17 10:53	
Chloromethane	ug/L	<0.080	4.0	0.080	06/15/17 10:53	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/15/17 10:53	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/15/17 10:53	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/15/17 10:53	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/15/17 10:53	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/15/17 10:53	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/15/17 10:53	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/15/17 10:53	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/15/17 10:53	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/15/17 10:53	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/15/17 10:53	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/15/17 10:53	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/15/17 10:53	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/15/17 10:53	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/15/17 10:53	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/15/17 10:53	
Naphthalene	ug/L	<0.064	1.0	0.064	06/15/17 10:53	
o-Xylene	ug/L	<0.044	0.50	0.044	06/15/17 10:53	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/15/17 10:53	
Styrene	ug/L	<0.056	0.50	0.056	06/15/17 10:53	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/15/17 10:53	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/15/17 10:53	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/15/17 10:53	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/15/17 10:53	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/15/17 10:53	
Toluene	ug/L	<0.059	1.0	0.059	06/15/17 10:53	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/15/17 10:53	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/15/17 10:53	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/15/17 10:53	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/15/17 10:53	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/15/17 10:53	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/15/17 10:53	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/15/17 10:53	
1,2-Dichloroethane-d4 (S)	%	96	75-137		06/15/17 10:53	
4-Bromofluorobenzene (S)	%	97	75-125		06/15/17 10:53	
Toluene-d8 (S)	%	96	75-125		06/15/17 10:53	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

LABORATORY CONTROL SAMPLE & LCSD: 2613118		2613119								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.1	21.8	111	109	75-136	1	30	
1,1,1-Trichloroethane	ug/L	20	21.5	20.9	107	104	75-129	3	30	
1,1,2,2-Tetrachloroethane	ug/L	20	19.1	19.0	96	95	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	19.1	19.0	95	95	75-125	0	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.9	21.6	109	108	69-126	1	30	
1,1-Dichloroethane	ug/L	20	20.2	20.1	101	101	75-125	0	30	
1,1-Dichloroethene	ug/L	20	20.9	20.7	105	104	75-125	1	30	
1,1-Dichloropropene	ug/L	20	21.3	21.4	106	107	75-125	1	30	
1,2,3-Trichlorobenzene	ug/L	20	19.0	19.8	95	99	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	19.7	19.6	99	98	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	19.4	19.8	97	99	75-125	2	30	
1,2,4-Trimethylbenzene	ug/L	20	19.2	19.3	96	96	75-125	0	30	
1,2-Dibromo-3-chloropropane	ug/L	50	47.8	47.3	96	95	71-130	1	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.8	21.0	104	105	75-125	1	30	
1,2-Dichlorobenzene	ug/L	20	21.0	21.1	105	106	75-125	1	30	
1,2-Dichloroethane	ug/L	20	19.4	19.6	97	98	70-125	1	30	
1,2-Dichloroethene (Total)	ug/L	40	41.4	41.0	103	103	75-125	1	30	
1,2-Dichloropropane	ug/L	20	20.3	20.1	101	100	75-125	1	30	
1,3,5-Trimethylbenzene	ug/L	20	20.6	20.6	103	103	75-125	0	30	
1,3-Dichlorobenzene	ug/L	20	20.7	20.3	104	101	75-125	2	30	
1,3-Dichloropropane	ug/L	20	20.5	20.4	102	102	75-125	0	30	
1,4-Dichlorobenzene	ug/L	20	20.1	20.2	101	101	75-125	0	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	399	427	100	107	64-140	7	30	
2,2,4-Trimethylpentane	ug/L	20	20.8	20.9	104	104	68-125	1	30	
2,2-Dichloropropane	ug/L	20	22.9	22.7	115	113	70-131	1	30	
2-Butanone (MEK)	ug/L	100	96.2	94.6	96	95	69-125	2	30	
2-Chlorotoluene	ug/L	20	20.1	20.0	101	100	75-125	1	30	
2-Hexanone	ug/L	100	99.4	98.7	99	99	73-129	1	30	
4-Chlorotoluene	ug/L	20	20.2	20.1	101	101	75-125	0	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.4	96.7	98	97	73-125	2	30	
Acetone	ug/L	100	142	137	142	137	66-126	4	30	CH,L1
Acrolein	ug/L	200	216	216	108	108	56-150	0	30	
Acrylonitrile	ug/L	200	195	194	97	97	68-129	1	30	
Benzene	ug/L	20	19.0	19.0	95	95	75-125	0	30	
Bromobenzene	ug/L	20	19.9	20.2	99	101	75-125	2	30	
Bromochloromethane	ug/L	20	21.5	21.9	107	109	75-126	2	30	
Bromodichloromethane	ug/L	20	21.1	20.9	106	104	75-133	1	30	
Bromoform	ug/L	20	20.6	20.6	103	103	62-142	0	30	
Bromomethane	ug/L	20	21.4	22.4	107	112	34-143	5	30	
Carbon disulfide	ug/L	20	20.1	19.6	100	98	71-125	2	30	
Carbon tetrachloride	ug/L	20	24.1	23.4	121	117	71-145	3	30	
Chlorobenzene	ug/L	20	20.1	20.3	101	102	75-125	1	30	
Chloroethane	ug/L	20	20.9	21.1	104	105	75-125	1	30	
Chloroform	ug/L	20	20.2	20.0	101	100	75-125	1	30	
Chloromethane	ug/L	20	20.1	20.1	100	100	54-125	0	30	
cis-1,2-Dichloroethene	ug/L	20	20.7	20.5	104	102	75-125	1	30	
cis-1,3-Dichloropropene	ug/L	20	20.4	20.5	102	103	75-125	0	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

LABORATORY CONTROL SAMPLE & LCSD: 2613118		2613119									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.3	20.7	101	104	74-141	2	30		
Dibromomethane	ug/L	20	22.4	22.8	112	114	75-125	2	30		
Dichlorodifluoromethane	ug/L	20	19.4	18.9	97	95	59-130	2	30		
Dichlorofluoromethane	ug/L	20	21.2	21.1	106	105	75-125	0	30		
Diisopropyl ether	ug/L	20	19.6	19.7	98	98	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.6	20.0	98	100	73-125	2	30		
Ethylbenzene	ug/L	20	20.0	19.7	100	98	75-125	1	30		
Hexachloro-1,3-butadiene	ug/L	20	23.4	23.7	117	119	75-131	1	30		
Isopropylbenzene (Cumene)	ug/L	20	21.5	21.1	108	105	75-125	2	30		
m&p-Xylene	ug/L	40	42.7	42.1	107	105	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	19.8	20.1	99	101	75-125	1	30		
Methylene Chloride	ug/L	20	18.7	18.7	93	93	73-125	0	30		
n-Butylbenzene	ug/L	20	21.6	20.7	108	103	75-125	4	30		
n-Propylbenzene	ug/L	20	19.9	19.4	99	97	75-125	3	30		
Naphthalene	ug/L	20	17.8	18.2	89	91	74-125	2	30		
o-Xylene	ug/L	20	21.3	21.3	107	106	75-125	0	30		
p-Isopropyltoluene	ug/L	20	20.0	19.8	100	99	75-125	1	30		
sec-Butylbenzene	ug/L	20	21.2	21.0	106	105	75-125	1	30		
Styrene	ug/L	20	19.7	19.4	98	97	75-125	1	30		
tert-Amylmethyl ether	ug/L	20	18.0	18.4	90	92	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	219	221	110	110	69-131	1	30		
tert-Butylbenzene	ug/L	20	20.7	20.5	103	103	75-125	1	30		
Tetrachloroethene	ug/L	20	21.2	20.9	106	105	75-125	1	30		
Tetrahydrofuran	ug/L	200	302	267	151	133	65-127	12	30	CH,L1	
Toluene	ug/L	20	18.0	17.8	90	89	75-125	1	30		
trans-1,2-Dichloroethene	ug/L	20	20.7	20.6	103	103	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	20	20.5	20.6	102	103	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	48.3	47.8	97	96	30-150	1	30		
Trichloroethene	ug/L	20	20.5	20.3	102	102	75-125	1	30		
Trichlorofluoromethane	ug/L	20	22.4	22.1	112	110	71-140	1	30		
Vinyl acetate	ug/L	20	20.9	20.6	104	103	68-137	1	30		
Vinyl chloride	ug/L	20	20.6	20.7	103	104	70-125	0	30		
Xylene (Total)	ug/L	60	64.0	63.4	107	106	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				93	93	75-137				
4-Bromofluorobenzene (S)	%				96	96	75-125				
Toluene-d8 (S)	%				96	97	75-125				

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 480065 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10391446001

METHOD BLANK: 2614566 Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/16/17 11:00	

LABORATORY CONTROL SAMPLE & LCSD: 2614567 2614568

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	38.6	41.3	97	103	90-110	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2614569 2614570

Parameter	Units	10392001003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	397	40	40	437	439	101	105	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2614571 2614572

Parameter	Units	10392241001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	462	40	40	528	516	163	133	80-120	2	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 479328      Analysis Method: SM 2540C  
QC Batch Method: SM 2540C      Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10391446001

METHOD BLANK: 2610910      Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/13/17 12:31	

LABORATORY CONTROL SAMPLE: 2610911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 2610912

Parameter	Units	10391264001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	678	678	0	10	

SAMPLE DUPLICATE: 2610913

Parameter	Units	10391264004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	623	617	1	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 82398 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10391446001

METHOD BLANK: 350514 Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/12/17 13:27	

LABORATORY CONTROL SAMPLE: 350515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	108	90-110	

MATRIX SPIKE SAMPLE: 350517

Parameter	Units	2055718001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.034	16	75-125	M1

SAMPLE DUPLICATE: 350516

Parameter	Units	2055718001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

QC Batch: 478791 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10391446001

METHOD BLANK: 2608462 Matrix: Water

Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/09/17 00:08	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/09/17 00:08	
Sulfate	mg/L	<0.16	1.2	0.16	06/09/17 00:08	

LABORATORY CONTROL SAMPLE: 2608463

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.2	106	90-110	
Nitrate as N	mg/L	1	1.1	107	90-110	
Sulfate	mg/L	12.5	13.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608464 2608465

Parameter	Units	10391449002		2608465		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	2.7	12.5	12.5	15.2	15.1	99	99	90-110	0	20		
Nitrate as N	mg/L	0.14	1	1	1.1	1.1	97	97	90-110	0	20		
Sulfate	mg/L	4.8	12.5	12.5	16.9	16.8	96	96	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 478945 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391446001

METHOD BLANK: 2609246 Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/09/17 15:06	

LABORATORY CONTROL SAMPLE: 2609247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609248 2609249

Parameter	Units	10390956001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	17.8	17.1	100	94	90-110	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609250 2609251

Parameter	Units	10391312005	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	0.67	1	1	1.6	1.6	96	93	90-110	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

QC Batch: 480302 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10391446001

METHOD BLANK: 2616335 Matrix: Water  
Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/19/17 15:43	

LABORATORY CONTROL SAMPLE: 2616336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	288	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616337 2616338

Parameter	Units	2616337		2616338		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10391445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chemical Oxygen Demand	mg/L	<15.8	250	250	245	245	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616339 2616340

Parameter	Units	2616339		2616340		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10391446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chemical Oxygen Demand	mg/L	<15.8	250	250	237	231	95	92	90-110	3	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

QC Batch: 116289

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10391446001

METHOD BLANK: 459009

Matrix: Water

Associated Lab Samples: 10391446001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/13/17 14:09	

LABORATORY CONTROL SAMPLE: 459010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 459011 459012

Parameter	Units	459011		459012		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10391449001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.43J	25	25	25.0	25.3	98	100	80-120	2	20

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391446

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis  
PASI-N Pace Analytical Services - New Orleans  
PASI-V Pace Analytical Services - Virginia

### WORKORDER QUALIFIERS

WO: 10391446  
[1] Method nitrate+nitrite by 353.2 was analyzed on sample LANG-GW-060617, per client request on 06/09/17.

### BATCH QUALIFIERS

Batch: 479772  
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.  
H1 Analysis conducted outside the recognized method holding time.  
L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391446

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391446001	LANG-GW-060617	RSK 175	478691		
10391446001	LANG-GW-060617	EPA 3010	479075	6010C Met	479698
10391446001	LANG-GW-060617	EPA 7470A	479083	EPA 7470A	480231
10391446001	LANG-GW-060617	EPA 8260B	479772		
10391446002	TRIP BLANK-060617	EPA 8260B	479772		
10391446001	LANG-GW-060617	SM 2320B	480065		
10391446001	LANG-GW-060617	SM 2540C	479328		
10391446001	LANG-GW-060617	SM 4500-S-2 D	82398		
10391446001	LANG-GW-060617	EPA 300.0	478791		
10391446001	LANG-GW-060617	EPA 353.2	478945		
10391446001	LANG-GW-060617	EPA 410.4	480302	EPA 410.4	480347
10391446001	LANG-GW-060617	SM 5310C	116289		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10391446

**Section A**

**Required Client Information:**

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2n.com  
 Phone: Fax: Requested Due Date/Circle: 24 Hour / 5 Day / **10 Day**

**Section B**

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #:  
 Project Name: UPRR\_Freeman  
 Project #: 1497

**Section C**

**Invoice Information:**

Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: CAS  
 Pace Quote:  
 Pace Project Manager:  
 Pace Profile #: 35447 / 4

Page: Of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX CODE Drinking Water: DW Water: WT Waste Water: WW Product: P Soil/Solid: SL Oil: OL Wipe: WP Air: AR Other: OT Tissue: TB	CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Y/N	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	
					START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Na2S2O3	Methanol	Other		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N			
					DATE	TIME	DATE	TIME																							
1	LANG - GW - 060617	WT G				6/6/17	1550	13	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X					001
2	Trip Blank - 060617	L L					0700	1				X				X														Trip Blank 002	
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	/ CH2M				6-8-17	945 5:3	y y y


SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	
SIGNATURE of SAMPLER:	
DATE Signed:	6-6-17

Page 43 of 48

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: **CH2M Hill UPRR** Project #:

**WO#: 10391446**



10391446

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: **7722 2739 9087**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **5.2** Cooler Temp Corrected (°C): **5.3** Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: **+0.1** Date and Initials of Person Examining Contents: **ME 6-8-17**

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -includes Date/Time/ID/Analysis Matrix: <b>wt</b>	12.
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide)	Sample # 1 1/2 1/2 1/2
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <b>1/2 Trip Blank</b>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>032917-3042</b>	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <b>1040</b> Temp: <b>5.2</b> Corrected Temp: <b>5.3</b>	
Time: _____ put in cooler	
Time: <b>1050</b> Temp: _____ Corrected Temp: _____	

**JENNI GROSS**

Date: **06/08/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

## WO# : 1289099

PM: HRZ Due Date: 06/22/17  
CLIENT: PACE MPLS

Page 45 of 48  
tical  
bs.com

Workorder: 10391446

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/8/2017 Results Requested By: 6/22/2017

Report To		Subcontract To		Requested Analysis																				
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																						
<b>Item</b>	<b>Sample ID</b>	<b>Sample Type</b>	<b>Collect Date/Time</b>	<b>Lab ID</b>	<b>Matrix</b>	<b>Other</b>																	<b>LAB USE ONLY</b>	
1	LANG-GW-060617	PS	6/6/2017 15:50	10391446001	Water	3																		
2																								
3																								
4																								
5																								

Comments

Transfers	Released By	Date/Time	Received By	Date/Time	
1	<i>Anna Asp</i> Pace MN	6/8/17 1300	<i>[Signature]</i>	6/8/17 1840	
2	<i>[Signature]</i>	6/9/17 2230	<i>[Signature]</i>	6-9-17 2015	
3					

<b>Cooler Temperature on Receipt</b> 2.2°C	<b>Custody Seal</b> <input checked="" type="checkbox"/> or <input type="checkbox"/> N	<b>Received on Ice</b> <input checked="" type="checkbox"/> or <input type="checkbox"/> N	<b>Samples Intact</b> <input checked="" type="checkbox"/> or <input type="checkbox"/> N
--	---	--	---

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace. MIV Project: **WO# : 1289099**

**PM: HRZ** Due Date: **06/22/17**  
**CLIENT: PACE MPLS**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: 1 x 2 Pacs

Temp Blank?  Yes  No

Thermometer Used:  140792808

Type of Ice:  Wet  Blue  None

Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.4

Cooler Temp Corrected °C: 2.2

Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C

Correction Factor: 0.3

Date and Initials of Person Examining Contents: JDL 6/19/17

Comments: not 6-9-17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Heather ZD

Date: 6/19/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

WO#: 2055902



alytical  
pace labs.com

Workorder: 10391446

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date:

07/01/2017

3/22/2017

Report To		Subcontract To				Requested Analysis												
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																
						5636267 / 4500 Sulfide												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers							LAB USE ONLY					
						H2SO4	NaOH+Zn											
1	LANG-GW-060617	PS	6/6/2017 15:50	10391446001	Water		1											
2																		
3																		
4																		
5																		
Transfers												Comments						
Released By	Date/Time	Received By	Date/Time															
<i>Amos O...</i>	Pace MN 6/8/17 1300	<i>Fred Eric</i>																
	<i>Fred Eric 6/9/17</i>	<i>Fred Eric</i>	<i>6/9/17</i>															
	<i>0830</i>		<i>0830</i>															
Cooler Temperature on Receipt: <i>2.0</i> °C		Custody Seal <i>Y</i> or N				Received on Ice <i>Y</i> or N				Samples Intact <i>Y</i> or N								

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Sample Condition Upon

WO#: 2055902

Pr

PM: ADC

Due Date: 06/22/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/10/17 JMB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8 500 Plastic preserved
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13 If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

June 21, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

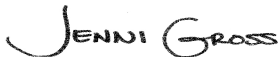
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 08, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: UST-078  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: MN00064  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8 Certification #: 8TMS-L  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Michigan Certification #: 9909

Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia WW Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

---

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842015-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC):  
E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC):  
T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391449001	LASHAW-DOM-GW-060617	Water	06/06/17 13:00	06/08/17 09:45
10391449002	LASHAW-AG-GW-060617	Water	06/06/17 14:30	06/08/17 09:45
10391449003	TRIP BLANK-060617	Water	06/06/17 07:00	06/08/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10391449001	LASHAW-DOM-GW-060617	RSK 175	MJL	3	PASI-M		
		6010C Met	IP	22	PASI-M		
		EPA 7470A	LMW	1	PASI-M		
		EPA 8260B	DJB	83	PASI-M		
		SM 2320B	JFP	1	PASI-M		
		SM 2540C	NAS	1	PASI-M		
		SM 4500-S-2 D	SMS2	1	PASI-N		
		EPA 300.0	KEO	3	PASI-M		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	KEO	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		
		10391449002	LASHAW-AG-GW-060617	RSK 175	MJL	3	PASI-M
				6010C Met	IP	22	PASI-M
EPA 7470A	LMW			1	PASI-M		
EPA 8260B	DJB			83	PASI-M		
SM 2320B	JFP			1	PASI-M		
SM 2540C	NAS			1	PASI-M		
SM 4500-S-2 D	SMS2			1	PASI-N		
EPA 300.0	KEO			3	PASI-M		
EPA 353.2	JFP			1	PASI-M		
EPA 410.4	KEO			1	PASI-M		
SM 5310C	CRE			1	PASI-V		
10391449003	TRIP BLANK-060617			EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391449001</b>	<b>LASHAW-DOM-GW-060617</b>					
RSK 175	Methane	1.4J	ug/L	10.0	06/08/17 15:32	
6010C Met	Barium, Dissolved	9.5J	ug/L	10.0	06/16/17 06:40	
6010C Met	Calcium, Dissolved	25800	ug/L	500	06/16/17 06:40	
6010C Met	Copper, Dissolved	2.4J	ug/L	10.0	06/16/17 06:40	
6010C Met	Magnesium, Dissolved	12400	ug/L	500	06/16/17 06:40	
6010C Met	Manganese, Dissolved	0.57J	ug/L	5.0	06/16/17 06:40	
6010C Met	Potassium, Dissolved	3780	ug/L	2500	06/16/17 06:40	
6010C Met	Sodium, Dissolved	14700	ug/L	1000	06/16/17 06:40	
6010C Met	Vanadium, Dissolved	11.8J	ug/L	15.0	06/16/17 06:40	
6010C Met	Zinc, Dissolved	11.0J	ug/L	20.0	06/16/17 06:40	
EPA 8260B	Acetone	32.3	ug/L	20.0	06/15/17 17:26	CH,L1
EPA 8260B	Carbon tetrachloride	0.77	ug/L	0.50	06/15/17 17:26	
SM 2320B	Alkalinity, Total as CaCO3	144	mg/L	5.0	06/16/17 13:45	
SM 2540C	Total Dissolved Solids	226	mg/L	10.0	06/13/17 12:31	
SM 4500-S-2 D	Sulfide, Total	0.0071J	mg/L	0.020	06/12/17 13:27	
EPA 300.0	Chloride	1.8	mg/L	1.2	06/09/17 02:24	
EPA 300.0	Nitrate as N	2.1	mg/L	0.10	06/09/17 02:24	H1
EPA 300.0	Sulfate	5.5	mg/L	1.2	06/09/17 02:24	
EPA 353.2	Nitrogen, NO2 plus NO3	2.0	mg/L	0.10	06/09/17 15:20	
SM 5310C	Total Organic Carbon	0.43J	mg/L	1.0	06/13/17 15:55	
<b>10391449002</b>	<b>LASHAW-AG-GW-060617</b>					
RSK 175	Methane	2.2J	ug/L	10.0	06/08/17 15:39	
6010C Met	Barium, Dissolved	35.4	ug/L	10.0	06/16/17 06:43	
6010C Met	Calcium, Dissolved	31800	ug/L	500	06/16/17 06:43	
6010C Met	Copper, Dissolved	2.2J	ug/L	10.0	06/16/17 06:43	
6010C Met	Iron, Dissolved	32.0J	ug/L	50.0	06/16/17 06:43	
6010C Met	Magnesium, Dissolved	12900	ug/L	500	06/16/17 06:43	
6010C Met	Manganese, Dissolved	29.8	ug/L	5.0	06/16/17 06:43	
6010C Met	Potassium, Dissolved	4430	ug/L	2500	06/16/17 06:43	
6010C Met	Sodium, Dissolved	16700	ug/L	1000	06/16/17 06:43	
6010C Met	Vanadium, Dissolved	3.1J	ug/L	15.0	06/16/17 06:43	
6010C Met	Zinc, Dissolved	94.6	ug/L	20.0	06/16/17 06:43	
EPA 8260B	Acetone	20.2	ug/L	20.0	06/15/17 17:48	CH,L1
EPA 8260B	Carbon tetrachloride	3.3	ug/L	0.50	06/15/17 17:48	
EPA 8260B	Chloroform	0.22J	ug/L	1.0	06/15/17 17:48	
SM 2320B	Alkalinity, Total as CaCO3	168	mg/L	5.0	06/16/17 13:50	
SM 2540C	Total Dissolved Solids	234	mg/L	10.0	06/13/17 12:31	
SM 4500-S-2 D	Sulfide, Total	0.0071J	mg/L	0.020	06/12/17 13:27	
EPA 300.0	Chloride	2.7	mg/L	1.2	06/08/17 23:23	
EPA 300.0	Nitrate as N	0.14	mg/L	0.10	06/08/17 23:23	H1
EPA 300.0	Sulfate	4.8	mg/L	1.2	06/08/17 23:23	
EPA 353.2	Nitrogen, NO2 plus NO3	0.15	mg/L	0.020	06/13/17 12:43	
SM 5310C	Total Organic Carbon	0.33J	mg/L	1.0	06/13/17 17:00	
<b>10391449003</b>	<b>TRIP BLANK-060617</b>					
EPA 8260B	Acetone	47.0	ug/L	20.0	06/15/17 13:04	CH,L1

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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**Date:** June 21, 2017

Method nitrate+nitrite by 353.2 was analyzed on samples LASHAW-DOM-GW-060617 and LASHAW-AG-GW-060617, per client request on 06/09/17.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

### General Information:

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 479772

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LASHAW-AG-GW-060617 (Lab ID: 10391449002)
  - Acetone
- LASHAW-DOM-GW-060617 (Lab ID: 10391449001)
  - Acetone
- LCS (Lab ID: 2613118)
  - Acetone
  - Tetrahydrofuran
- LCSD (Lab ID: 2613119)
  - Acetone
  - Tetrahydrofuran
- TRIP BLANK-060617 (Lab ID: 10391449003)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 479772

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2613118)
  - Acetone

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

QC Batch: 479772

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- Tetrahydrofuran
- LCSD (Lab ID: 2613119)
  - Acetone
  - Tetrahydrofuran

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479772

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 480065

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392001003,10392241001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2614571)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2614572)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 82398

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2055718001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 350517)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- LASHAW-AG-GW-060617 (Lab ID: 10391449002)
- LASHAW-DOM-GW-060617 (Lab ID: 10391449001)

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

---

**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 21, 2017

**General Information:**

2 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Sample: LASHAW-DOM-GW-060617 Lab ID: 10391449001 Collected: 06/06/17 13:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/08/17 15:32	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/08/17 15:32	74-85-1	
Methane	1.4J	ug/L	10.0	1.1	1		06/08/17 15:32	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 06:40	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:40	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:40	7440-38-2	
Barium, Dissolved	9.5J	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 06:40	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 06:40	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 06:40	7440-43-9	
Calcium, Dissolved	25800	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 06:40	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 06:40	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 06:40	7440-48-4	
Copper, Dissolved	2.4J	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 06:40	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 06:40	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 06:40	7439-92-1	
Magnesium, Dissolved	12400	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 06:40	7439-95-4	
Manganese, Dissolved	0.57J	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 06:40	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 06:40	7440-02-0	
Potassium, Dissolved	3780	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 06:40	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 06:40	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 06:40	7440-22-4	
Sodium, Dissolved	14700	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 06:40	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 06:40	7440-28-0	
Vanadium, Dissolved	11.8J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 06:40	7440-62-2	
Zinc, Dissolved	11.0J	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 06:40	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 15:26	7439-97-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 17:26	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 17:26	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:26	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 17:26	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 17:26	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:26	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 17:26	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 17:26	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 17:26	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 17:26	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 17:26	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 17:26	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 17:26	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 17:26	106-93-4	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Sample: LASHAW-DOM-GW-060617 Lab ID: 10391449001 Collected: 06/06/17 13:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 17:26	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 17:26	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 17:26	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 17:26	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 17:26	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 17:26	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 17:26	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 17:26	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 17:26	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 17:26	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 17:26	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 17:26	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 17:26	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 17:26	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 17:26	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 17:26	108-10-1	
Acetone	32.3	ug/L	20.0	0.64	1		06/15/17 17:26	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 17:26	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 17:26	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 17:26	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 17:26	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 17:26	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 17:26	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 17:26	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 17:26	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 17:26	75-15-0	
Carbon tetrachloride	0.77	ug/L	0.50	0.079	1		06/15/17 17:26	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 17:26	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 17:26	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 17:26	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 17:26	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 17:26	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 17:26	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 17:26	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 17:26	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 17:26	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 17:26	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 17:26	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 17:26	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 17:26	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 17:26	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 17:26	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 17:26	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 17:26	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 17:26	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 17:26	109-99-9	L3

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Sample: LASHAW-DOM-GW-060617 Lab ID: 10391449001 Collected: 06/06/17 13:00 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 17:26	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 17:26	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:26	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 17:26	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 17:26	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 17:26	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 17:26	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 17:26	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 17:26	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 17:26	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 17:26	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 17:26	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 17:26	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 17:26	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 17:26	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 17:26	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 17:26	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 17:26	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 17:26	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 17:26	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		06/15/17 17:26	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/15/17 17:26	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		06/15/17 17:26	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	144	mg/L	5.0	1.4	1		06/16/17 13:45		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	226	mg/L	10.0	5.0	1		06/13/17 12:31		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	0.0071J	mg/L	0.020	0.0050	1		06/12/17 13:27	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.8	mg/L	1.2	0.10	1		06/09/17 02:24	16887-00-6	
Nitrate as N	2.1	mg/L	0.10	0.013	1		06/09/17 02:24	14797-55-8	H1
Sulfate	5.5	mg/L	1.2	0.16	1		06/09/17 02:24	14808-79-8	
<b>353.2 Nitrate + Nitrite</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	2.0	mg/L	0.10	0.037	5		06/09/17 15:20		
<b>410.4 COD</b>		Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:47		

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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**Sample: LASHAW-DOM-GW-060617**    **Lab ID: 10391449001**    Collected: 06/06/17 13:00    Received: 06/08/17 09:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.43J</b>	mg/L	1.0	0.20	1		06/13/17 15:55	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

**Sample: LASHAW-AG-GW-060617**    **Lab ID: 10391449002**    Collected: 06/06/17 14:30    Received: 06/08/17 09:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/08/17 15:39	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/08/17 15:39	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		06/08/17 15:39	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met    Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 06:43	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:43	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:43	7440-38-2	
Barium, Dissolved	35.4	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 06:43	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 06:43	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 06:43	7440-43-9	
Calcium, Dissolved	31800	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 06:43	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 06:43	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 06:43	7440-48-4	
Copper, Dissolved	2.2J	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 06:43	7440-50-8	
Iron, Dissolved	32.0J	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 06:43	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 06:43	7439-92-1	
Magnesium, Dissolved	12900	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 06:43	7439-95-4	
Manganese, Dissolved	29.8	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 06:43	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 06:43	7440-02-0	
Potassium, Dissolved	4430	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 06:43	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 06:43	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 06:43	7440-22-4	
Sodium, Dissolved	16700	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 06:43	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 06:43	7440-28-0	
Vanadium, Dissolved	3.1J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 06:43	7440-62-2	
Zinc, Dissolved	94.6	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 06:43	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A    Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 15:29	7439-97-6	
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 17:48	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 17:48	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:48	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 17:48	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 17:48	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:48	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 17:48	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 17:48	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 17:48	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 17:48	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 17:48	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 17:48	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 17:48	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 17:48	106-93-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Sample: LASHAW-AG-GW-060617 Lab ID: 10391449002 Collected: 06/06/17 14:30 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 17:48	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 17:48	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 17:48	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 17:48	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 17:48	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 17:48	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 17:48	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 17:48	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 17:48	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 17:48	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 17:48	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 17:48	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 17:48	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 17:48	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 17:48	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 17:48	108-10-1	
Acetone	20.2	ug/L	20.0	0.64	1		06/15/17 17:48	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 17:48	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 17:48	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 17:48	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 17:48	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 17:48	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 17:48	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 17:48	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 17:48	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 17:48	75-15-0	
Carbon tetrachloride	3.3	ug/L	0.50	0.079	1		06/15/17 17:48	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 17:48	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 17:48	75-00-3	
Chloroform	0.22J	ug/L	1.0	0.21	1		06/15/17 17:48	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 17:48	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 17:48	124-48-1	
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 17:48	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 17:48	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 17:48	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 17:48	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 17:48	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 17:48	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 17:48	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 17:48	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 17:48	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 17:48	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 17:48	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 17:48	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 17:48	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 17:48	109-99-9	L3

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Sample: LASHAW-AG-GW-060617 Lab ID: 10391449002 Collected: 06/06/17 14:30 Received: 06/08/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 17:48	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 17:48	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 17:48	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 17:48	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 17:48	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 17:48	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 17:48	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 17:48	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 17:48	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 17:48	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 17:48	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 17:48	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 17:48	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 17:48	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 17:48	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 17:48	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 17:48	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 17:48	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 17:48	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 17:48	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		06/15/17 17:48	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/15/17 17:48	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/15/17 17:48	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	168	mg/L	5.0	1.4	1		06/16/17 13:50		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	234	mg/L	10.0	5.0	1		06/13/17 12:31		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	0.0071J	mg/L	0.020	0.0050	1		06/12/17 13:27	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	2.7	mg/L	1.2	0.10	1		06/08/17 23:23	16887-00-6	
Nitrate as N	0.14	mg/L	0.10	0.013	1		06/08/17 23:23	14797-55-8	H1
Sulfate	4.8	mg/L	1.2	0.16	1		06/08/17 23:23	14808-79-8	
<b>353.2 Nitrate + Nitrite</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	0.15	mg/L	0.020	0.0075	1		06/13/17 12:43		
<b>410.4 COD</b>		Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:47		

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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**Sample: LASHAW-AG-GW-060617**    **Lab ID: 10391449002**    Collected: 06/06/17 14:30    Received: 06/08/17 09:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.33J</b>	mg/L	1.0	0.20	1		06/13/17 17:00	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

**Sample: TRIP BLANK-060617**      **Lab ID: 10391449003**      Collected: 06/06/17 07:00      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 13:04	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 13:04	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 13:04	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 13:04	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 13:04	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 13:04	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 13:04	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 13:04	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 13:04	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 13:04	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 13:04	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 13:04	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 13:04	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 13:04	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 13:04	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 13:04	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 13:04	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 13:04	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 13:04	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 13:04	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 13:04	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 13:04	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 13:04	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 13:04	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 13:04	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 13:04	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 13:04	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 13:04	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 13:04	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 13:04	108-10-1	
Acetone	47.0	ug/L	20.0	0.64	1		06/15/17 13:04	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 13:04	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 13:04	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 13:04	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 13:04	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 13:04	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 13:04	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 13:04	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 13:04	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 13:04	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 13:04	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 13:04	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 13:04	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 13:04	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 13:04	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 13:04	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

**Sample: TRIP BLANK-060617**      **Lab ID: 10391449003**      Collected: 06/06/17 07:00      Received: 06/08/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 13:04	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 13:04	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 13:04	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 13:04	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 13:04	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 13:04	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 13:04	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 13:04	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 13:04	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 13:04	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 13:04	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 13:04	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 13:04	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 13:04	109-99-9	L3
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 13:04	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 13:04	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 13:04	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 13:04	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 13:04	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 13:04	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 13:04	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 13:04	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 13:04	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 13:04	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 13:04	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 13:04	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 13:04	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 13:04	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 13:04	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 13:04	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 13:04	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 13:04	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 13:04	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 13:04	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		06/15/17 13:04	17060-07-0	
Toluene-d8 (S)	94	%	75-125		1		06/15/17 13:04	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		06/15/17 13:04	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 478691 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2608000 Matrix: Water  
Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/08/17 13:50	
Ethene	ug/L	<0.68	10.0	0.68	06/08/17 13:50	
Methane	ug/L	1.4J	10.0	1.1	06/08/17 13:50	

LABORATORY CONTROL SAMPLE & LCSD: 2608001

Parameter	Units	2608002								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	117	110	103	97	85-115	7	20	
Ethene	ug/L	106	110	104	104	98	85-115	6	20	
Methane	ug/L	60.7	61.8	57.8	102	95	85-115	7	20	

SAMPLE DUPLICATE: 2608003

Parameter	Units	10391445001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.9J	1.8J		20	

SAMPLE DUPLICATE: 2608004

Parameter	Units	10391449002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	2.2J	1.7J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

QC Batch: 479083

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2610059

Matrix: Water

Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/20/17 15:13	

LABORATORY CONTROL SAMPLE: 2610060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610061 2610062

Parameter	Units	2610061		2610062		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.							
Mercury, Dissolved	ug/L	<0.062	5	5	4.2	4.6	85	92	80-120	8	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 479075 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2610031 Matrix: Water  
Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/16/17 06:12	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/16/17 06:12	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/16/17 06:12	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/16/17 06:12	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/16/17 06:12	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/16/17 06:12	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/16/17 06:12	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/16/17 06:12	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/16/17 06:12	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/16/17 06:12	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/16/17 06:12	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/16/17 06:12	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/16/17 06:12	
Potassium, Dissolved	ug/L	71.3J	2500	26.1	06/16/17 06:12	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/16/17 06:12	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/16/17 06:12	
Sodium, Dissolved	ug/L	27.8J	1000	12.0	06/16/17 06:12	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/16/17 06:12	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/16/17 06:12	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/16/17 06:12	

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	991	99	80-120	
Arsenic, Dissolved	ug/L	1000	1010	101	80-120	
Barium, Dissolved	ug/L	1000	992	99	80-120	
Beryllium, Dissolved	ug/L	1000	1000	100	80-120	
Cadmium, Dissolved	ug/L	1000	991	99	80-120	
Calcium, Dissolved	ug/L	20000	19000	95	80-120	
Chromium, Dissolved	ug/L	1000	979	98	80-120	
Cobalt, Dissolved	ug/L	1000	981	98	80-120	
Copper, Dissolved	ug/L	1000	972	97	80-120	
Iron, Dissolved	ug/L	20000	19600	98	80-120	
Lead, Dissolved	ug/L	1000	994	99	80-120	
Magnesium, Dissolved	ug/L	20000	19500	98	80-120	
Manganese, Dissolved	ug/L	1000	994	99	80-120	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	987	99	80-120	
Potassium, Dissolved	ug/L	20000	19100	96	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	485	97	80-120	
Sodium, Dissolved	ug/L	20000	18800	94	80-120	
Thallium, Dissolved	ug/L	1000	982	98	80-120	
Vanadium, Dissolved	ug/L	1000	955	96	80-120	
Zinc, Dissolved	ug/L	1000	986	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610033 2610034

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10391445001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	<13.5	20000	20000	20400	20700	102	103	75-125	1	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1000	1000	100	100	75-125	0	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1010	1020	101	102	75-125	1	20	
Barium, Dissolved	ug/L	86.0	1000	1000	1060	1070	97	98	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1000	1010	100	101	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	977	989	98	99	75-125	1	20	
Calcium, Dissolved	ug/L	69100	20000	20000	88200	89000	95	99	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	963	973	96	97	75-125	1	20	
Cobalt, Dissolved	ug/L	0.96J	1000	1000	943	958	94	96	75-125	2	20	
Copper, Dissolved	ug/L	354	1000	1000	1320	1340	97	99	75-125	1	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	19300	19400	96	97	75-125	1	20	
Lead, Dissolved	ug/L	2.1J	1000	1000	967	979	97	98	75-125	1	20	
Magnesium, Dissolved	ug/L	20200	20000	20000	39700	40100	98	100	75-125	1	20	
Manganese, Dissolved	ug/L	0.88J	1000	1000	971	983	97	98	75-125	1	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	945	955	94	95	75-125	1	20	
Potassium, Dissolved	ug/L	1310J	20000	20000	20900	21200	98	99	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1030	1050	103	105	75-125	1	20	
Silver, Dissolved	ug/L	<0.28	500	500	481	486	96	97	75-125	1	20	
Sodium, Dissolved	ug/L	21200	20000	20000	40600	40700	97	97	75-125	0	20	
Thallium, Dissolved	ug/L	4.8J	1000	1000	959	970	95	97	75-125	1	20	
Vanadium, Dissolved	ug/L	10.7J	1000	1000	956	967	95	96	75-125	1	20	
Zinc, Dissolved	ug/L	30.0	1000	1000	974	987	94	96	75-125	1	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 479772 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391449001, 10391449002, 10391449003

METHOD BLANK: 2613117 Matrix: Water  
Associated Lab Samples: 10391449001, 10391449002, 10391449003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/15/17 10:53	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/15/17 10:53	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/15/17 10:53	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/15/17 10:53	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/15/17 10:53	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/15/17 10:53	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/15/17 10:53	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/15/17 10:53	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/15/17 10:53	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/15/17 10:53	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/15/17 10:53	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/15/17 10:53	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/15/17 10:53	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/15/17 10:53	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/15/17 10:53	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/15/17 10:53	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/15/17 10:53	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/15/17 10:53	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/15/17 10:53	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/15/17 10:53	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/15/17 10:53	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/15/17 10:53	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/15/17 10:53	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/15/17 10:53	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/15/17 10:53	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/15/17 10:53	
Acetone	ug/L	<0.64	20.0	0.64	06/15/17 10:53	
Acrolein	ug/L	<2.1	10.0	2.1	06/15/17 10:53	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/15/17 10:53	
Benzene	ug/L	<0.042	0.50	0.042	06/15/17 10:53	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/15/17 10:53	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/15/17 10:53	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/15/17 10:53	
Bromoform	ug/L	<0.11	4.0	0.11	06/15/17 10:53	
Bromomethane	ug/L	<0.20	4.0	0.20	06/15/17 10:53	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/15/17 10:53	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/15/17 10:53	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

METHOD BLANK: 2613117 Matrix: Water  
Associated Lab Samples: 10391449001, 10391449002, 10391449003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/15/17 10:53	
Chloroethane	ug/L	<0.12	1.0	0.12	06/15/17 10:53	
Chloroform	ug/L	<0.21	1.0	0.21	06/15/17 10:53	
Chloromethane	ug/L	<0.080	4.0	0.080	06/15/17 10:53	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/15/17 10:53	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/15/17 10:53	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/15/17 10:53	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/15/17 10:53	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/15/17 10:53	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/15/17 10:53	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/15/17 10:53	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/15/17 10:53	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/15/17 10:53	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/15/17 10:53	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/15/17 10:53	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/15/17 10:53	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/15/17 10:53	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/15/17 10:53	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/15/17 10:53	
Naphthalene	ug/L	<0.064	1.0	0.064	06/15/17 10:53	
o-Xylene	ug/L	<0.044	0.50	0.044	06/15/17 10:53	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/15/17 10:53	
Styrene	ug/L	<0.056	0.50	0.056	06/15/17 10:53	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/15/17 10:53	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/15/17 10:53	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/15/17 10:53	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/15/17 10:53	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/15/17 10:53	
Toluene	ug/L	<0.059	1.0	0.059	06/15/17 10:53	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/15/17 10:53	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/15/17 10:53	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/15/17 10:53	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/15/17 10:53	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/15/17 10:53	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/15/17 10:53	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/15/17 10:53	
1,2-Dichloroethane-d4 (S)	%	96	75-137		06/15/17 10:53	
4-Bromofluorobenzene (S)	%	97	75-125		06/15/17 10:53	
Toluene-d8 (S)	%	96	75-125		06/15/17 10:53	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

LABORATORY CONTROL SAMPLE & LCSD: 2613118		2613119								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.1	21.8	111	109	75-136	1	30	
1,1,1-Trichloroethane	ug/L	20	21.5	20.9	107	104	75-129	3	30	
1,1,2,2-Tetrachloroethane	ug/L	20	19.1	19.0	96	95	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	19.1	19.0	95	95	75-125	0	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.9	21.6	109	108	69-126	1	30	
1,1-Dichloroethane	ug/L	20	20.2	20.1	101	101	75-125	0	30	
1,1-Dichloroethene	ug/L	20	20.9	20.7	105	104	75-125	1	30	
1,1-Dichloropropene	ug/L	20	21.3	21.4	106	107	75-125	1	30	
1,2,3-Trichlorobenzene	ug/L	20	19.0	19.8	95	99	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	19.7	19.6	99	98	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	19.4	19.8	97	99	75-125	2	30	
1,2,4-Trimethylbenzene	ug/L	20	19.2	19.3	96	96	75-125	0	30	
1,2-Dibromo-3-chloropropane	ug/L	50	47.8	47.3	96	95	71-130	1	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.8	21.0	104	105	75-125	1	30	
1,2-Dichlorobenzene	ug/L	20	21.0	21.1	105	106	75-125	1	30	
1,2-Dichloroethane	ug/L	20	19.4	19.6	97	98	70-125	1	30	
1,2-Dichloroethene (Total)	ug/L	40	41.4	41.0	103	103	75-125	1	30	
1,2-Dichloropropane	ug/L	20	20.3	20.1	101	100	75-125	1	30	
1,3,5-Trimethylbenzene	ug/L	20	20.6	20.6	103	103	75-125	0	30	
1,3-Dichlorobenzene	ug/L	20	20.7	20.3	104	101	75-125	2	30	
1,3-Dichloropropane	ug/L	20	20.5	20.4	102	102	75-125	0	30	
1,4-Dichlorobenzene	ug/L	20	20.1	20.2	101	101	75-125	0	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	399	427	100	107	64-140	7	30	
2,2,4-Trimethylpentane	ug/L	20	20.8	20.9	104	104	68-125	1	30	
2,2-Dichloropropane	ug/L	20	22.9	22.7	115	113	70-131	1	30	
2-Butanone (MEK)	ug/L	100	96.2	94.6	96	95	69-125	2	30	
2-Chlorotoluene	ug/L	20	20.1	20.0	101	100	75-125	1	30	
2-Hexanone	ug/L	100	99.4	98.7	99	99	73-129	1	30	
4-Chlorotoluene	ug/L	20	20.2	20.1	101	101	75-125	0	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.4	96.7	98	97	73-125	2	30	
Acetone	ug/L	100	142	137	142	137	66-126	4	30	CH,L1
Acrolein	ug/L	200	216	216	108	108	56-150	0	30	
Acrylonitrile	ug/L	200	195	194	97	97	68-129	1	30	
Benzene	ug/L	20	19.0	19.0	95	95	75-125	0	30	
Bromobenzene	ug/L	20	19.9	20.2	99	101	75-125	2	30	
Bromochloromethane	ug/L	20	21.5	21.9	107	109	75-126	2	30	
Bromodichloromethane	ug/L	20	21.1	20.9	106	104	75-133	1	30	
Bromoform	ug/L	20	20.6	20.6	103	103	62-142	0	30	
Bromomethane	ug/L	20	21.4	22.4	107	112	34-143	5	30	
Carbon disulfide	ug/L	20	20.1	19.6	100	98	71-125	2	30	
Carbon tetrachloride	ug/L	20	24.1	23.4	121	117	71-145	3	30	
Chlorobenzene	ug/L	20	20.1	20.3	101	102	75-125	1	30	
Chloroethane	ug/L	20	20.9	21.1	104	105	75-125	1	30	
Chloroform	ug/L	20	20.2	20.0	101	100	75-125	1	30	
Chloromethane	ug/L	20	20.1	20.1	100	100	54-125	0	30	
cis-1,2-Dichloroethene	ug/L	20	20.7	20.5	104	102	75-125	1	30	
cis-1,3-Dichloropropene	ug/L	20	20.4	20.5	102	103	75-125	0	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

LABORATORY CONTROL SAMPLE & LCSD: 2613118		2613119									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.3	20.7	101	104	74-141	2	30		
Dibromomethane	ug/L	20	22.4	22.8	112	114	75-125	2	30		
Dichlorodifluoromethane	ug/L	20	19.4	18.9	97	95	59-130	2	30		
Dichlorofluoromethane	ug/L	20	21.2	21.1	106	105	75-125	0	30		
Diisopropyl ether	ug/L	20	19.6	19.7	98	98	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.6	20.0	98	100	73-125	2	30		
Ethylbenzene	ug/L	20	20.0	19.7	100	98	75-125	1	30		
Hexachloro-1,3-butadiene	ug/L	20	23.4	23.7	117	119	75-131	1	30		
Isopropylbenzene (Cumene)	ug/L	20	21.5	21.1	108	105	75-125	2	30		
m&p-Xylene	ug/L	40	42.7	42.1	107	105	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	19.8	20.1	99	101	75-125	1	30		
Methylene Chloride	ug/L	20	18.7	18.7	93	93	73-125	0	30		
n-Butylbenzene	ug/L	20	21.6	20.7	108	103	75-125	4	30		
n-Propylbenzene	ug/L	20	19.9	19.4	99	97	75-125	3	30		
Naphthalene	ug/L	20	17.8	18.2	89	91	74-125	2	30		
o-Xylene	ug/L	20	21.3	21.3	107	106	75-125	0	30		
p-Isopropyltoluene	ug/L	20	20.0	19.8	100	99	75-125	1	30		
sec-Butylbenzene	ug/L	20	21.2	21.0	106	105	75-125	1	30		
Styrene	ug/L	20	19.7	19.4	98	97	75-125	1	30		
tert-Amylmethyl ether	ug/L	20	18.0	18.4	90	92	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	219	221	110	110	69-131	1	30		
tert-Butylbenzene	ug/L	20	20.7	20.5	103	103	75-125	1	30		
Tetrachloroethene	ug/L	20	21.2	20.9	106	105	75-125	1	30		
Tetrahydrofuran	ug/L	200	302	267	151	133	65-127	12	30	CH,L1	
Toluene	ug/L	20	18.0	17.8	90	89	75-125	1	30		
trans-1,2-Dichloroethene	ug/L	20	20.7	20.6	103	103	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	20	20.5	20.6	102	103	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	48.3	47.8	97	96	30-150	1	30		
Trichloroethene	ug/L	20	20.5	20.3	102	102	75-125	1	30		
Trichlorofluoromethane	ug/L	20	22.4	22.1	112	110	71-140	1	30		
Vinyl acetate	ug/L	20	20.9	20.6	104	103	68-137	1	30		
Vinyl chloride	ug/L	20	20.6	20.7	103	104	70-125	0	30		
Xylene (Total)	ug/L	60	64.0	63.4	107	106	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				93	93	75-137				
4-Bromofluorobenzene (S)	%				96	96	75-125				
Toluene-d8 (S)	%				96	97	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 480065 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2614566 Matrix: Water  
Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/16/17 11:00	

LABORATORY CONTROL SAMPLE & LCSD: 2614567 2614568

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	38.6	41.3	97	103	90-110	7	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2614569 2614570

Parameter	Units	10392001003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	397	40	40	437	439	101	105	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2614571 2614572

Parameter	Units	10392241001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	462	40	40	528	516	163	133	80-120	2	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

QC Batch: 479328

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2610910

Matrix: Water

Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/13/17 12:31	

LABORATORY CONTROL SAMPLE: 2610911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 2610912

Parameter	Units	10391264001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	678	678	0	10	

SAMPLE DUPLICATE: 2610913

Parameter	Units	10391264004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	623	617	1	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 82398 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 350514 Matrix: Water  
Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/12/17 13:27	

LABORATORY CONTROL SAMPLE: 350515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	108	90-110	

MATRIX SPIKE SAMPLE: 350517

Parameter	Units	2055718001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.034	16	75-125	M1

SAMPLE DUPLICATE: 350516

Parameter	Units	2055718001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

QC Batch: 478791

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2608462

Matrix: Water

Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/09/17 00:08	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/09/17 00:08	
Sulfate	mg/L	<0.16	1.2	0.16	06/09/17 00:08	

LABORATORY CONTROL SAMPLE: 2608463

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.2	106	90-110	
Nitrate as N	mg/L	1	1.1	107	90-110	
Sulfate	mg/L	12.5	13.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608464 2608465

Parameter	Units	10391449002		2608465		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	2.7	12.5	12.5	15.2	15.1	99	99	90-110	0	20		
Nitrate as N	mg/L	0.14	1	1	1.1	1.1	97	97	90-110	0	20		
Sulfate	mg/L	4.8	12.5	12.5	16.9	16.8	96	96	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 478945 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391449001

METHOD BLANK: 2609246 Matrix: Water  
Associated Lab Samples: 10391449001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/09/17 15:06	

LABORATORY CONTROL SAMPLE: 2609247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609248 2609249

Parameter	Units	10390956001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	17.8	17.1	100	94	90-110	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609250 2609251

Parameter	Units	10391312005	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	0.67	1	1	1.6	1.6	96	93	90-110	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391449

QC Batch: 479394 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391449002

METHOD BLANK: 2611118 Matrix: Water  
Associated Lab Samples: 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/13/17 13:08	FS

LABORATORY CONTROL SAMPLE: 2611119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.95	95	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611120 2611121

Parameter	Units	10391532001		2611120		2611121		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	0.79	1	1	1	1.7	1.7	91	93	90-110	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611122 2611123

Parameter	Units	10391532002		2611122		2611123		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	0.97	1	1	1	1.9	1.9	93	95	90-110	1	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

QC Batch: 480302

Analysis Method: EPA 410.4

QC Batch Method: EPA 410.4

Analysis Description: 410.4 COD

Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 2616335

Matrix: Water

Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/19/17 15:43	

LABORATORY CONTROL SAMPLE: 2616336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	288	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616337 2616338

Parameter	Units	10391445001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chemical Oxygen Demand	mg/L	<15.8	250	245	250	245	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616339 2616340

Parameter	Units	10391446001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chemical Oxygen Demand	mg/L	<15.8	250	237	250	231	95	92	90-110	3	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

QC Batch: 116289 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10391449001, 10391449002

METHOD BLANK: 459009 Matrix: Water

Associated Lab Samples: 10391449001, 10391449002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/13/17 14:09	

LABORATORY CONTROL SAMPLE: 459010

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 459011 459012

Parameter	Units	10391449001		459012		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.43J	25	25	25.0	25.3	98	100	80-120	2	20

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### WORKORDER QUALIFIERS

WO: 10391449

[1] Method nitrate+nitrite by 353.2 was analyzed on samples LASHAW-DOM-GW-060617 and LASHAW-AG-GW-060617, per client request on 06/09/17.

### BATCH QUALIFIERS

Batch: 479772

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

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### ANALYTE QUALIFIERS

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391449


Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391449001	LASHAW-DOM-GW-060617	RSK 175	478691		
10391449002	LASHAW-AG-GW-060617	RSK 175	478691		
10391449001	LASHAW-DOM-GW-060617	EPA 3010	479075	6010C Met	479698
10391449002	LASHAW-AG-GW-060617	EPA 3010	479075	6010C Met	479698
10391449001	LASHAW-DOM-GW-060617	EPA 7470A	479083	EPA 7470A	480231
10391449002	LASHAW-AG-GW-060617	EPA 7470A	479083	EPA 7470A	480231
10391449001	LASHAW-DOM-GW-060617	EPA 8260B	479772		
10391449002	LASHAW-AG-GW-060617	EPA 8260B	479772		
10391449003	TRIP BLANK-060617	EPA 8260B	479772		
10391449001	LASHAW-DOM-GW-060617	SM 2320B	480065		
10391449002	LASHAW-AG-GW-060617	SM 2320B	480065		
10391449001	LASHAW-DOM-GW-060617	SM 2540C	479328		
10391449002	LASHAW-AG-GW-060617	SM 2540C	479328		
10391449001	LASHAW-DOM-GW-060617	SM 4500-S-2 D	82398		
10391449002	LASHAW-AG-GW-060617	SM 4500-S-2 D	82398		
10391449001	LASHAW-DOM-GW-060617	EPA 300.0	478791		
10391449002	LASHAW-AG-GW-060617	EPA 300.0	478791		
10391449001	LASHAW-DOM-GW-060617	EPA 353.2	478945		
10391449002	LASHAW-AG-GW-060617	EPA 353.2	479394		
10391449001	LASHAW-DOM-GW-060617	EPA 410.4	480302	EPA 410.4	480347
10391449002	LASHAW-AG-GW-060617	EPA 410.4	480302	EPA 410.4	480347
10391449001	LASHAW-DOM-GW-060617	SM 5310C	116289		
10391449002	LASHAW-AG-GW-060617	SM 5310C	116289		

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**Sample Condition Upon Receipt - ESI Tech Specs**     
 Client Name: CH2M Hill UPRR     
 Project #: **WO#: 10391449**

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_  
 Tracking Number: 7222 2739 9087     
 Barcode:      
 10391449

Custody Seal on Cooler/Box Present?  Yes     No     
 Seals Intact?  Yes     No     
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Packing Material:  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_     
 Temp Blank?  Yes     No  
 Thermometer Used:  151401163     151401164     
 Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 5.2     
 Cooler Temp Corrected (°C): 5.3     
 Biological Tissue Frozen?  Yes     No     N/A  
 Temp should be above freezing to 6°C     
 Correction Factor: +0.1     
 Date and Initials of Person Examining Contents: ME 10-8-17

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No     
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2</u> %    %    %
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>1/2</u> trip Blanks
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>050817-3C4E</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1040</u>	Temp: <u>5.2</u>	Corrected Temp: <u>5.3</u>
Time: _____	put in cooler	
Time: <u>1050</u>	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS      Date: 06/08/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



# Chain of Custody

**WO#: 1289094**  
 PM: HRZ Due Date: 06/22/17  
 CLIENT: PACE MPLS

Page 15 of 54  
 Pace Analytical  
 www.pacelabs.com

Workorder: 10391449 Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/8/2017 Results Requested by: 6/22/2017

Report To		Subcontract To					Requested Analysis															
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					<div style="display: flex; justify-content: space-between;"> <span>5632354 / 5310 TOC</span> </div>															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers															LAB USE ONLY	
						Other																
1	LASHAW-DOM-GW-060617	PS	6/6/2017 13:00	10391449001	Water	3						X										001
2	LASHAW-AG-GW-060617	PS	6/6/2017 14:30	10391449002	Water	3						X										002
3																						
4																						
5																						
Transfers															Comments							
Released By	Date/Time	Received By	Date/Time																			
<i>[Signature]</i>	Pace MN 6/8/17 1300	<i>[Signature]</i>	6/8/17 1840																			
<i>[Signature]</i>	6/8/17 2230	<i>[Signature]</i>	6-9-17 0715																			
3																						
Cooler Temperature on Receipt 2.2 °C		Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N														

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace - MN Project #: \_\_\_\_\_

**WO# : 1289094**  
 PM: HRZ Due Date: 06/22/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: 1 x 2 PVC Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.9 Cooler Temp Corrected °C: 2.2 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: JNL 6/19/17

Comments: NT 6-19-17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE  Y  N

TEMPERATURE WAIVER ON FILE  Y  N

Project Manager Review: Heather 3W Date: 6/19/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 2055900



Workorder: 10391449

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/8/2017

Results Requested By: 6/22/2017

Report To		Subcontract To				Requested Analysis												
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers						5636267 / 4500 Sulfide	LAB USE ONLY					
						H2SO4	NaOH+Zn	Acetate										
1	LASHAW-DOM-GW-060617	PS	6/6/2017 13:00	10391449001	Water		1					X						
2	LASHAW-AG-GW-060617	PS	6/6/2017 14:30	10391449002	Water		1					X						
3																		
4																		
5																		

Transfers					Comments											
Released By	Date/Time	Received By	Date/Time													
<i>[Signature]</i> Pace MN	6/8/17 1300	<i>[Signature]</i>														
<i>[Signature]</i>	6/9/17 0830	<i>[Signature]</i> Pace	6/9/17 0830													

Cooler Temperature on Receipt 2.0 °C    Custody Seal  or N    Received on Ice  or N    Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Sample Condition I

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

WO#: 2055900

PM: ADC

Due Date: 06/22/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other  
Custody Seal on Cooler/Box Present: [see COC] Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  Therm Fisher IR 6  Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Date and Initials of person examining contents: 6/10/17 JMB

Cooler Temperature: [see COC] Temp should be above freezing to 6°C

Temp must be measured from Temperature blank when present			Comments:
Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	500 Plastic preserved
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Person Contacted: \_\_\_\_\_  
Comments/ Resolution: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

June 26, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

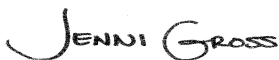
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 10, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414	Minnesota Certification #: 027-053-137
A2LA Certification #: 2926.01	Mississippi Certification #: MN00064
Alabama Certification #: 40770	Montana Certification #: CERT0092
Alaska Contaminated Sites Certification #: UST-078	Nebraska Certification #: NE-OS-18-06
Alaska DW Certification #: MN00064	Nevada Certification #: MN00064
Arizona Certification #: AZ0014	New Hampshire Certification #: 2081
Arkansas Certification #: 88-0680	New Jersey Certification #: MN002
California Certification #: MN00064	New York Certification #: 11647
CNMI Saipan Certification #:MP0003	North Carolina DW Certification #: 27700
Colorado Certification #: MN00064	North Carolina WW Certification #: 530
Connecticut Certification #: PH-0256	North Dakota Certification #: R-036
EPA Region 8 Certification #: 8TMS-L	Ohio DW Certification #: 41244
Florida Certification #: E87605	Ohio VAP Certification #: CL101
Georgia Certification #: 959	Oklahoma Certification #: 9507
Guam EPA Certification #: MN00064	Oregon NwTPH Certification #: MN300001
Hawaii Certification #: MN00064	Oregon Secondary Certification #: MN200001
Idaho Certification #: MN00064	Pennsylvania Certification #: 68-00563
Illinois Certification #: 200011	Puerto Rico Certification #: MN00064
Indiana Certification #: C-MN-01	South Carolina Certification #:74003001
Iowa Certification #: 368	Tennessee Certification #: TN02818
Kansas Certification #: E-10167	Texas Certification #: T104704192
Kentucky DW Certification #: 90062	Utah Certification #: MN00064
Kentucky WW Certification #: 90062	Virginia Certification #: 460163
Louisiana DEQ Certification #: 03086	Washington Certification #: C486
Louisiana DW Certification #: MN00064	West Virginia DW Certification #: 9952 C
Maine Certification #: MN00064	West Virginia WW Certification #: 382
Maryland Certification #: 322	Wisconsin Certification #: 999407970
Michigan Certification #: 9909	Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792	Minnesota Dept of Health Certification #: 027-137-445
Montana Certificate #CERT0103	North Dakota Certification: # R-203
California Certification #2973	Wisconsin DNR Certification # : 998027470
California Certification #2973	WA Department of Ecology Lab ID# C1007
Alaska Certification UST-107	Nevada DNR #MN010842015-1
Alaska Certification UST-107	Oklahoma Department of Environmental Quality
Alaska Certification #MN01084	California Certification #2973
Arizona Department of Health Certification #AZ0785	

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA	Pennsylvania Dept. of Env Protection (NELAC): 68-04202
Florida Department of Health (NELAC): E87595	Texas Commission on Env. Quality (NELAC): T104704405-09-TX
Illinois Environmental Protection Agency: 0025721	U.S. Dept. of Agriculture Foreign Soil Import: P330-10- 00119
Kansas Department of Health and Environment (NELAC): E-10266	Commonwealth of Virginia (TNI): 480246
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006	

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391798001	MW16D-GW-060717	Water	06/07/17 10:55	06/10/17 09:00
10391798002	MW18D-GW-060717	Water	06/07/17 15:20	06/10/17 09:00
10391798003	FD03-GW-060717	Water	06/07/17 08:00	06/10/17 09:00
10391798004	MW02D-GW-060817	Water	06/08/17 10:15	06/10/17 09:00
10391798005	MW01D-GW-060817	Water	06/08/17 12:40	06/10/17 09:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391798001	MW16D-GW-060717	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391798002	MW18D-GW-060717	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391798003	FD03-GW-060717	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391798004	MW02D-GW-060817	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391798005	MW01D-GW-060817	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10391798001</b>	<b>MW16D-GW-060717</b>					
RSK 175	Methane	1.8J	ug/L	10.0	06/12/17 15:28	
6010C Met	Barium, Dissolved	56.8	ug/L	10.0	06/16/17 06:57	
6010C Met	Calcium, Dissolved	59300	ug/L	500	06/16/17 06:57	
6010C Met	Cobalt, Dissolved	0.63J	ug/L	10.0	06/16/17 06:57	
6010C Met	Magnesium, Dissolved	17800	ug/L	500	06/16/17 06:57	
6010C Met	Manganese, Dissolved	1.2J	ug/L	5.0	06/16/17 06:57	
6010C Met	Potassium, Dissolved	1480J	ug/L	2500	06/16/17 06:57	
6010C Met	Sodium, Dissolved	17100	ug/L	1000	06/16/17 06:57	
6010C Met	Vanadium, Dissolved	9.3J	ug/L	15.0	06/16/17 06:57	
SM 2320B	Alkalinity, Total as CaCO3	219	mg/L	5.0	06/16/17 13:49	
SM 2540C	Total Dissolved Solids	347	mg/L	10.0	06/13/17 15:29	
EPA 300.0	Chloride	7.3	mg/L	1.2	06/10/17 23:04	M1
EPA 300.0	Nitrate as N	6.0	mg/L	0.10	06/10/17 23:04	H3,M1
EPA 300.0	Sulfate	23.4	mg/L	1.2	06/10/17 23:04	M1
EPA 353.2	Nitrogen, NO2 plus NO3	6.0	mg/L	0.10	06/13/17 13:55	
SM 5310C	Total Organic Carbon	1.0	mg/L	1.0	06/16/17 14:42	
<b>10391798002</b>	<b>MW18D-GW-060717</b>					
RSK 175	Methane	2.2J	ug/L	10.0	06/12/17 15:35	
6010C Met	Barium, Dissolved	50.4	ug/L	10.0	06/16/17 07:00	
6010C Met	Calcium, Dissolved	22500	ug/L	500	06/16/17 07:00	
6010C Met	Chromium, Dissolved	3.0J	ug/L	10.0	06/16/17 07:00	
6010C Met	Iron, Dissolved	83.9	ug/L	50.0	06/16/17 07:00	
6010C Met	Lead, Dissolved	2.3J	ug/L	10.0	06/16/17 07:00	
6010C Met	Magnesium, Dissolved	15400	ug/L	500	06/16/17 07:00	
6010C Met	Manganese, Dissolved	53.4	ug/L	5.0	06/16/17 07:00	
6010C Met	Potassium, Dissolved	3660	ug/L	2500	06/16/17 07:00	
6010C Met	Sodium, Dissolved	19500	ug/L	1000	06/16/17 07:00	
6010C Met	Vanadium, Dissolved	0.72J	ug/L	15.0	06/16/17 07:00	
6010C Met	Zinc, Dissolved	2.6J	ug/L	20.0	06/16/17 07:00	
SM 2320B	Alkalinity, Total as CaCO3	160	mg/L	5.0	06/16/17 13:53	
SM 2540C	Total Dissolved Solids	212	mg/L	10.0	06/13/17 15:29	
EPA 300.0	Chloride	3.0	mg/L	1.2	06/11/17 00:07	
EPA 300.0	Nitrate as N	0.037J	mg/L	0.10	06/11/17 00:07	H3
EPA 300.0	Sulfate	8.3	mg/L	1.2	06/11/17 00:07	
SM 5310C	Total Organic Carbon	0.69J	mg/L	1.0	06/16/17 14:55	
<b>10391798003</b>	<b>FD03-GW-060717</b>					
RSK 175	Methane	1.6J	ug/L	10.0	06/12/17 15:42	
6010C Met	Barium, Dissolved	59.2	ug/L	10.0	06/16/17 07:03	
6010C Met	Calcium, Dissolved	61500	ug/L	500	06/16/17 07:03	
6010C Met	Cobalt, Dissolved	0.60J	ug/L	10.0	06/16/17 07:03	
6010C Met	Magnesium, Dissolved	18500	ug/L	500	06/16/17 07:03	
6010C Met	Manganese, Dissolved	1.3J	ug/L	5.0	06/16/17 07:03	
6010C Met	Potassium, Dissolved	1550J	ug/L	2500	06/16/17 07:03	
6010C Met	Sodium, Dissolved	17900	ug/L	1000	06/16/17 07:03	
6010C Met	Thallium, Dissolved	4.6J	ug/L	20.0	06/16/17 07:03	
6010C Met	Vanadium, Dissolved	9.7J	ug/L	15.0	06/16/17 07:03	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10391798003</b>	<b>FD03-GW-060717</b>					
SM 2320B	Alkalinity, Total as CaCO3	219	mg/L	5.0	06/16/17 13:58	
SM 2540C	Total Dissolved Solids	372	mg/L	10.0	06/13/17 15:29	
EPA 300.0	Chloride	7.3	mg/L	1.2	06/11/17 00:22	
EPA 300.0	Nitrate as N	6.0	mg/L	0.10	06/11/17 00:22	H3
EPA 300.0	Sulfate	23.5	mg/L	1.2	06/11/17 00:22	
EPA 353.2	Nitrogen, NO2 plus NO3	6.0	mg/L	0.10	06/13/17 13:56	
SM 5310C	Total Organic Carbon	1.0	mg/L	1.0	06/16/17 15:08	
<b>10391798004</b>	<b>MW02D-GW-060817</b>					
RSK 175	Ethane	6.5J	ug/L	10.0	06/12/17 16:47	
RSK 175	Ethene	2.0J	ug/L	10.0	06/12/17 16:47	
RSK 175	Methane	128	ug/L	10.0	06/12/17 16:47	
6010C Met	Barium, Dissolved	119	ug/L	10.0	06/16/17 07:11	
6010C Met	Calcium, Dissolved	39100	ug/L	500	06/16/17 07:11	
6010C Met	Cobalt, Dissolved	1.4J	ug/L	10.0	06/16/17 07:11	
6010C Met	Iron, Dissolved	2910	ug/L	50.0	06/16/17 07:11	
6010C Met	Lead, Dissolved	2.3J	ug/L	10.0	06/16/17 07:11	
6010C Met	Magnesium, Dissolved	11600	ug/L	500	06/16/17 07:11	
6010C Met	Manganese, Dissolved	1870	ug/L	5.0	06/16/17 07:11	
6010C Met	Potassium, Dissolved	5130	ug/L	2500	06/16/17 07:11	
6010C Met	Sodium, Dissolved	17600	ug/L	1000	06/16/17 07:11	
6010C Met	Vanadium, Dissolved	0.53J	ug/L	15.0	06/16/17 07:11	
SM 2320B	Alkalinity, Total as CaCO3	190	mg/L	5.0	06/16/17 14:45	
SM 2540C	Total Dissolved Solids	205	mg/L	10.0	06/14/17 14:48	
EPA 300.0	Chloride	1.6	mg/L	1.2	06/11/17 00:37	
EPA 300.0	Nitrate as N	0.042J	mg/L	0.10	06/11/17 00:37	H1
EPA 300.0	Sulfate	0.43J	mg/L	1.2	06/11/17 00:37	
EPA 353.2	Nitrogen, NO2 plus NO3	0.030	mg/L	0.020	06/13/17 13:29	
SM 5310C	Total Organic Carbon	1.6	mg/L	1.0	06/16/17 15:47	
<b>10391798005</b>	<b>MW01D-GW-060817</b>					
RSK 175	Ethene	1.2J	ug/L	10.0	06/12/17 16:54	
RSK 175	Methane	10.2	ug/L	10.0	06/12/17 16:54	
6010C Met	Aluminum, Dissolved	23.7J	ug/L	200	06/16/17 07:14	
6010C Met	Barium, Dissolved	66.6	ug/L	10.0	06/16/17 07:14	
6010C Met	Calcium, Dissolved	49200	ug/L	500	06/16/17 07:14	
6010C Met	Cobalt, Dissolved	2.8J	ug/L	10.0	06/16/17 07:14	
6010C Met	Iron, Dissolved	664	ug/L	50.0	06/16/17 07:14	
6010C Met	Magnesium, Dissolved	12100	ug/L	500	06/16/17 07:14	
6010C Met	Manganese, Dissolved	324	ug/L	5.0	06/16/17 07:14	
6010C Met	Potassium, Dissolved	2540	ug/L	2500	06/16/17 07:14	
6010C Met	Sodium, Dissolved	11400	ug/L	1000	06/16/17 07:14	
6010C Met	Thallium, Dissolved	3.9J	ug/L	20.0	06/16/17 07:14	
6010C Met	Vanadium, Dissolved	1.1J	ug/L	15.0	06/16/17 07:14	
6010C Met	Zinc, Dissolved	5.4J	ug/L	20.0	06/16/17 07:14	
SM 2320B	Alkalinity, Total as CaCO3	200	mg/L	5.0	06/16/17 14:49	
SM 2540C	Total Dissolved Solids	237	mg/L	10.0	06/14/17 14:48	
EPA 300.0	Chloride	1.9	mg/L	1.2	06/11/17 00:52	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391798005</b>	<b>MW01D-GW-060817</b>					
EPA 300.0	Sulfate	2.3	mg/L	1.2	06/11/17 00:52	
EPA 353.2	Nitrogen, NO2 plus NO3	0.014J	mg/L	0.020	06/13/17 13:30	
SM 5310C	Total Organic Carbon	1.3	mg/L	1.0	06/16/17 16:00	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

### General Information:

5 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW01D-GW-060817 (Lab ID: 10391798005)
- MW02D-GW-060817 (Lab ID: 10391798004)

H3: Sample was received or analysis requested beyond the recognized method holding time.

- FD03-GW-060717 (Lab ID: 10391798003)
- MW16D-GW-060717 (Lab ID: 10391798001)
- MW18D-GW-060717 (Lab ID: 10391798002)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479028

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10391798001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2609948)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2609949)
  - Chloride
  - Nitrate as N
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 479396

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2611131)
  - Nitrogen, NO2 plus NO3
- MS (Lab ID: 2611133)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2611132)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2611134)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

5 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

**Sample: MW16D-GW-060717**      **Lab ID: 10391798001**      Collected: 06/07/17 10:55      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/12/17 15:28	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/12/17 15:28	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		06/12/17 15:28	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 06:57	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:57	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 06:57	7440-38-2	
Barium, Dissolved	56.8	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 06:57	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 06:57	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 06:57	7440-43-9	
Calcium, Dissolved	59300	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 06:57	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 06:57	7440-47-3	
Cobalt, Dissolved	0.63J	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 06:57	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 06:57	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 06:57	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 06:57	7439-92-1	
Magnesium, Dissolved	17800	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 06:57	7439-95-4	
Manganese, Dissolved	1.2J	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 06:57	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 06:57	7440-02-0	
Potassium, Dissolved	1480J	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 06:57	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 06:57	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 06:57	7440-22-4	
Sodium, Dissolved	17100	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 06:57	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 06:57	7440-28-0	
Vanadium, Dissolved	9.3J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 06:57	7440-62-2	
Zinc, Dissolved	<1.4	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 06:57	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 16:01	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	219	mg/L	5.0	1.4	1		06/16/17 13:49		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	347	mg/L	10.0	5.0	1		06/13/17 15:29		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/14/17 14:33	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	7.3	mg/L	1.2	0.10	1		06/10/17 23:04	16887-00-6	M1
Nitrate as N	6.0	mg/L	0.10	0.013	1		06/10/17 23:04	14797-55-8	H3,M1
Sulfate	23.4	mg/L	1.2	0.16	1		06/10/17 23:04	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Sample: MW16D-GW-060717**      **Lab ID: 10391798001**      Collected: 06/07/17 10:55      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>6.0</b>	mg/L	0.10	0.037	5		06/13/17 13:55		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:48		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>1.0</b>	mg/L	1.0	0.20	1		06/16/17 14:42	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

Sample: MW18D-GW-060717 Lab ID: 10391798002 Collected: 06/07/17 15:20 Received: 06/10/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/12/17 15:35	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/12/17 15:35	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		06/12/17 15:35	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 07:00	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:00	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:00	7440-38-2	
Barium, Dissolved	50.4	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 07:00	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 07:00	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 07:00	7440-43-9	
Calcium, Dissolved	22500	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 07:00	7440-70-2	
Chromium, Dissolved	3.0J	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 07:00	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 07:00	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 07:00	7440-50-8	
Iron, Dissolved	83.9	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 07:00	7439-89-6	
Lead, Dissolved	2.3J	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 07:00	7439-92-1	
Magnesium, Dissolved	15400	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 07:00	7439-95-4	
Manganese, Dissolved	53.4	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 07:00	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 07:00	7440-02-0	
Potassium, Dissolved	3660	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 07:00	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 07:00	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 07:00	7440-22-4	
Sodium, Dissolved	19500	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 07:00	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 07:00	7440-28-0	
Vanadium, Dissolved	0.72J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 07:00	7440-62-2	
Zinc, Dissolved	2.6J	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 07:00	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 16:03	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	160	mg/L	5.0	1.4	1		06/16/17 13:53		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	212	mg/L	10.0	5.0	1		06/13/17 15:29		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/14/17 14:38	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.0	mg/L	1.2	0.10	1		06/11/17 00:07	16887-00-6	
Nitrate as N	0.037J	mg/L	0.10	0.013	1		06/11/17 00:07	14797-55-8	H3
Sulfate	8.3	mg/L	1.2	0.16	1		06/11/17 00:07	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Sample: MW18D-GW-060717**      **Lab ID: 10391798002**      Collected: 06/07/17 15:20      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		06/13/17 13:05		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:48		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.69J</b>	mg/L	1.0	0.20	1		06/16/17 14:55	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

**Sample: FD03-GW-060717**      **Lab ID: 10391798003**      Collected: 06/07/17 08:00      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/12/17 15:42	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/12/17 15:42	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		06/12/17 15:42	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 07:03	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:03	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:03	7440-38-2	
Barium, Dissolved	59.2	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 07:03	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 07:03	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 07:03	7440-43-9	
Calcium, Dissolved	61500	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 07:03	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 07:03	7440-47-3	
Cobalt, Dissolved	0.60J	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 07:03	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 07:03	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 07:03	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 07:03	7439-92-1	
Magnesium, Dissolved	18500	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 07:03	7439-95-4	
Manganese, Dissolved	1.3J	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 07:03	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 07:03	7440-02-0	
Potassium, Dissolved	1550J	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 07:03	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 07:03	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 07:03	7440-22-4	
Sodium, Dissolved	17900	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 07:03	7440-23-5	
Thallium, Dissolved	4.6J	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 07:03	7440-28-0	
Vanadium, Dissolved	9.7J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 07:03	7440-62-2	
Zinc, Dissolved	<1.4	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 07:03	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 16:05	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	219	mg/L	5.0	1.4	1		06/16/17 13:58		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	372	mg/L	10.0	5.0	1		06/13/17 15:29		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/14/17 14:40	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.3	mg/L	1.2	0.10	1		06/11/17 00:22	16887-00-6	
Nitrate as N	6.0	mg/L	0.10	0.013	1		06/11/17 00:22	14797-55-8	H3
Sulfate	23.5	mg/L	1.2	0.16	1		06/11/17 00:22	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Sample: FD03-GW-060717**      **Lab ID: 10391798003**      Collected: 06/07/17 08:00      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>6.0</b>	mg/L	0.10	0.037	5		06/13/17 13:56		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:49		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.0</b>	mg/L	1.0	0.20	1		06/16/17 15:08	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

**Sample: MW02D-GW-060817**      **Lab ID: 10391798004**      Collected: 06/08/17 10:15      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<b>6.5J</b>	ug/L	10.0	4.9	1		06/12/17 16:47	74-84-0	
Ethene	<b>2.0J</b>	ug/L	10.0	0.68	1		06/12/17 16:47	74-85-1	
Methane	<b>128</b>	ug/L	10.0	1.1	1		06/12/17 16:47	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<b>&lt;13.5</b>	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 07:11	7429-90-5	
Antimony, Dissolved	<b>&lt;2.5</b>	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:11	7440-36-0	
Arsenic, Dissolved	<b>&lt;2.5</b>	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:11	7440-38-2	
Barium, Dissolved	<b>119</b>	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 07:11	7440-39-3	
Beryllium, Dissolved	<b>&lt;0.064</b>	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 07:11	7440-41-7	
Cadmium, Dissolved	<b>&lt;0.30</b>	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 07:11	7440-43-9	
Calcium, Dissolved	<b>39100</b>	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 07:11	7440-70-2	
Chromium, Dissolved	<b>&lt;2.0</b>	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 07:11	7440-47-3	
Cobalt, Dissolved	<b>1.4J</b>	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 07:11	7440-48-4	
Copper, Dissolved	<b>&lt;0.89</b>	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 07:11	7440-50-8	
Iron, Dissolved	<b>2910</b>	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 07:11	7439-89-6	
Lead, Dissolved	<b>2.3J</b>	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 07:11	7439-92-1	
Magnesium, Dissolved	<b>11600</b>	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 07:11	7439-95-4	
Manganese, Dissolved	<b>1870</b>	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 07:11	7439-96-5	
Nickel, Dissolved	<b>&lt;1.6</b>	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 07:11	7440-02-0	
Potassium, Dissolved	<b>5130</b>	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 07:11	7440-09-7	
Selenium, Dissolved	<b>&lt;4.5</b>	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 07:11	7782-49-2	
Silver, Dissolved	<b>&lt;0.28</b>	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 07:11	7440-22-4	
Sodium, Dissolved	<b>17600</b>	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 07:11	7440-23-5	
Thallium, Dissolved	<b>&lt;3.8</b>	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 07:11	7440-28-0	
Vanadium, Dissolved	<b>0.53J</b>	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 07:11	7440-62-2	
Zinc, Dissolved	<b>&lt;1.4</b>	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 07:11	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<b>&lt;0.062</b>	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 16:07	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	<b>190</b>	mg/L	5.0	1.4	1		06/16/17 14:45		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	<b>205</b>	mg/L	10.0	5.0	1		06/14/17 14:48		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<b>&lt;0.0050</b>	mg/L	0.020	0.0050	1		06/15/17 16:20	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	<b>1.6</b>	mg/L	1.2	0.10	1		06/11/17 00:37	16887-00-6	
Nitrate as N	<b>0.042J</b>	mg/L	0.10	0.013	1		06/11/17 00:37	14797-55-8	H1
Sulfate	<b>0.43J</b>	mg/L	1.2	0.16	1		06/11/17 00:37	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Sample: MW02D-GW-060817**      **Lab ID: 10391798004**      Collected: 06/08/17 10:15      Received: 06/10/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.030</b>	mg/L	0.020	0.0075	1		06/13/17 13:29		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:49		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.6</b>	mg/L	1.0	0.20	1		06/16/17 15:47	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

**Sample: MW01D-GW-060817**      **Lab ID: 10391798005**      Collected: 06/08/17 12:40      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/12/17 16:54	74-84-0	
Ethene	1.2J	ug/L	10.0	0.68	1		06/12/17 16:54	74-85-1	
Methane	10.2	ug/L	10.0	1.1	1		06/12/17 16:54	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	23.7J	ug/L	200	13.5	1	06/14/17 10:20	06/16/17 07:14	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:14	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/14/17 10:20	06/16/17 07:14	7440-38-2	
Barium, Dissolved	66.6	ug/L	10.0	0.20	1	06/14/17 10:20	06/16/17 07:14	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/14/17 10:20	06/16/17 07:14	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/14/17 10:20	06/16/17 07:14	7440-43-9	
Calcium, Dissolved	49200	ug/L	500	15.8	1	06/14/17 10:20	06/16/17 07:14	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/14/17 10:20	06/16/17 07:14	7440-47-3	
Cobalt, Dissolved	2.8J	ug/L	10.0	0.51	1	06/14/17 10:20	06/16/17 07:14	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/14/17 10:20	06/16/17 07:14	7440-50-8	
Iron, Dissolved	664	ug/L	50.0	18.0	1	06/14/17 10:20	06/16/17 07:14	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/14/17 10:20	06/16/17 07:14	7439-92-1	
Magnesium, Dissolved	12100	ug/L	500	7.4	1	06/14/17 10:20	06/16/17 07:14	7439-95-4	
Manganese, Dissolved	324	ug/L	5.0	0.33	1	06/14/17 10:20	06/16/17 07:14	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/14/17 10:20	06/16/17 07:14	7440-02-0	
Potassium, Dissolved	2540	ug/L	2500	26.1	1	06/14/17 10:20	06/16/17 07:14	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/14/17 10:20	06/16/17 07:14	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/14/17 10:20	06/16/17 07:14	7440-22-4	
Sodium, Dissolved	11400	ug/L	1000	12.0	1	06/14/17 10:20	06/16/17 07:14	7440-23-5	
Thallium, Dissolved	3.9J	ug/L	20.0	3.8	1	06/14/17 10:20	06/16/17 07:14	7440-28-0	
Vanadium, Dissolved	1.1J	ug/L	15.0	0.39	1	06/14/17 10:20	06/16/17 07:14	7440-62-2	
Zinc, Dissolved	5.4J	ug/L	20.0	1.4	1	06/14/17 10:20	06/16/17 07:14	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/16/17 12:25	06/20/17 16:10	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	200	mg/L	5.0	1.4	1		06/16/17 14:49		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	237	mg/L	10.0	5.0	1		06/14/17 14:48		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/15/17 16:23	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.9	mg/L	1.2	0.10	1		06/11/17 00:52	16887-00-6	
Nitrate as N	<0.013	mg/L	0.10	0.013	1		06/11/17 00:52	14797-55-8	H1
Sulfate	2.3	mg/L	1.2	0.16	1		06/11/17 00:52	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

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**Sample: MW01D-GW-060817**      **Lab ID: 10391798005**      Collected: 06/08/17 12:40      Received: 06/10/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.014J</b>	mg/L	0.020	0.0075	1		06/13/17 13:30		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:49		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.3</b>	mg/L	1.0	0.20	1		06/16/17 16:00	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

QC Batch: 479090 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 2610085 Matrix: Water  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/12/17 14:38	
Ethene	ug/L	<0.68	10.0	0.68	06/12/17 14:38	
Methane	ug/L	1.6J	10.0	1.1	06/12/17 14:38	

LABORATORY CONTROL SAMPLE & LCSD: 2610086

Parameter	Units	2610087							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
Ethane	ug/L	114	105	128	93	112	85-115	19	20	
Ethene	ug/L	106	98.6	119	93	112	85-115	19	20	
Methane	ug/L	60.7	55.9	67.2	92	111	85-115	18	20	

SAMPLE DUPLICATE: 2610088

Parameter	Units	35316644005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	4.9U	<4.9		20	
Ethene	ug/L	0.68U	<0.68		20	
Methane	ug/L	47.1	48.9	4	20	

SAMPLE DUPLICATE: 2610089

Parameter	Units	60246094002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	188	202	7	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 479083

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 2610059

Matrix: Water

Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/20/17 15:13	

LABORATORY CONTROL SAMPLE: 2610060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610061 2610062

Parameter	Units	10391446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.2	4.6	85	92	80-120	8	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

QC Batch: 479075 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 2610031 Matrix: Water  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/16/17 06:12	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/16/17 06:12	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/16/17 06:12	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/16/17 06:12	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/16/17 06:12	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/16/17 06:12	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/16/17 06:12	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/16/17 06:12	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/16/17 06:12	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/16/17 06:12	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/16/17 06:12	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/16/17 06:12	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/16/17 06:12	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/16/17 06:12	
Potassium, Dissolved	ug/L	71.3J	2500	26.1	06/16/17 06:12	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/16/17 06:12	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/16/17 06:12	
Sodium, Dissolved	ug/L	27.8J	1000	12.0	06/16/17 06:12	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/16/17 06:12	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/16/17 06:12	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/16/17 06:12	

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	991	99	80-120	
Arsenic, Dissolved	ug/L	1000	1010	101	80-120	
Barium, Dissolved	ug/L	1000	992	99	80-120	
Beryllium, Dissolved	ug/L	1000	1000	100	80-120	
Cadmium, Dissolved	ug/L	1000	991	99	80-120	
Calcium, Dissolved	ug/L	20000	19000	95	80-120	
Chromium, Dissolved	ug/L	1000	979	98	80-120	
Cobalt, Dissolved	ug/L	1000	981	98	80-120	
Copper, Dissolved	ug/L	1000	972	97	80-120	
Iron, Dissolved	ug/L	20000	19600	98	80-120	
Lead, Dissolved	ug/L	1000	994	99	80-120	
Magnesium, Dissolved	ug/L	20000	19500	98	80-120	
Manganese, Dissolved	ug/L	1000	994	99	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

LABORATORY CONTROL SAMPLE: 2610032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	987	99	80-120	
Potassium, Dissolved	ug/L	20000	19100	96	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	485	97	80-120	
Sodium, Dissolved	ug/L	20000	18800	94	80-120	
Thallium, Dissolved	ug/L	1000	982	98	80-120	
Vanadium, Dissolved	ug/L	1000	955	96	80-120	
Zinc, Dissolved	ug/L	1000	986	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610033 2610034

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10391445001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	<13.5	20000	20000	20400	20700	102	103	75-125	1	20	
Antimony, Dissolved	ug/L	<2.5	1000	1000	1000	1000	100	100	75-125	0	20	
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1010	1020	101	102	75-125	1	20	
Barium, Dissolved	ug/L	86.0	1000	1000	1060	1070	97	98	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1000	1010	100	101	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.30	1000	1000	977	989	98	99	75-125	1	20	
Calcium, Dissolved	ug/L	69100	20000	20000	88200	89000	95	99	75-125	1	20	
Chromium, Dissolved	ug/L	<2.0	1000	1000	963	973	96	97	75-125	1	20	
Cobalt, Dissolved	ug/L	0.96J	1000	1000	943	958	94	96	75-125	2	20	
Copper, Dissolved	ug/L	354	1000	1000	1320	1340	97	99	75-125	1	20	
Iron, Dissolved	ug/L	<18.0	20000	20000	19300	19400	96	97	75-125	1	20	
Lead, Dissolved	ug/L	2.1J	1000	1000	967	979	97	98	75-125	1	20	
Magnesium, Dissolved	ug/L	20200	20000	20000	39700	40100	98	100	75-125	1	20	
Manganese, Dissolved	ug/L	0.88J	1000	1000	971	983	97	98	75-125	1	20	
Nickel, Dissolved	ug/L	<1.6	1000	1000	945	955	94	95	75-125	1	20	
Potassium, Dissolved	ug/L	1310J	20000	20000	20900	21200	98	99	75-125	1	20	
Selenium, Dissolved	ug/L	<4.5	1000	1000	1030	1050	103	105	75-125	1	20	
Silver, Dissolved	ug/L	<0.28	500	500	481	486	96	97	75-125	1	20	
Sodium, Dissolved	ug/L	21200	20000	20000	40600	40700	97	97	75-125	0	20	
Thallium, Dissolved	ug/L	4.8J	1000	1000	959	970	95	97	75-125	1	20	
Vanadium, Dissolved	ug/L	10.7J	1000	1000	956	967	95	96	75-125	1	20	
Zinc, Dissolved	ug/L	30.0	1000	1000	974	987	94	96	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

QC Batch: 480066 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 2614573 Matrix: Water  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/16/17 11:12	

LABORATORY CONTROL SAMPLE & LCSD: 2614574 2614575

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.8	41.7	105	104	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2614576 2614577

Parameter	Units	10391616001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	104	40	40	146	143	105	97	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2614578 2614579

Parameter	Units	10391618001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	106	40	40	145	147	98	103	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 479329

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10391798001, 10391798002, 10391798003

METHOD BLANK: 2610914

Matrix: Water

Associated Lab Samples: 10391798001, 10391798002, 10391798003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	9.0J	10.0	5.0	06/13/17 15:29	

LABORATORY CONTROL SAMPLE: 2610915

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	968	97	80-120	

SAMPLE DUPLICATE: 2610916

Parameter	Units	10391512013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1400	1400	0	10	

SAMPLE DUPLICATE: 2610917

Parameter	Units	10391512015 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	752	739	2	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 479533

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10391798004, 10391798005

METHOD BLANK: 2611940

Matrix: Water

Associated Lab Samples: 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/14/17 14:48	

LABORATORY CONTROL SAMPLE: 2611941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	934	93	80-120	

SAMPLE DUPLICATE: 2611942

Parameter	Units	10391578002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	969	974	1	10	

SAMPLE DUPLICATE: 2611943

Parameter	Units	10391967001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1800	1640	9	10	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 82622 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10391798001, 10391798002, 10391798003

METHOD BLANK: 351482 Matrix: Water

Associated Lab Samples: 10391798001, 10391798002, 10391798003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/14/17 14:30	

LABORATORY CONTROL SAMPLE: 351483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	109	90-110	

MATRIX SPIKE SAMPLE: 351485

Parameter	Units	10391798001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.21	105	75-125	

SAMPLE DUPLICATE: 351484

Parameter	Units	10391798001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 82719

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10391798004, 10391798005

METHOD BLANK: 352040

Matrix: Water

Associated Lab Samples: 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/15/17 16:10	

LABORATORY CONTROL SAMPLE: 352041

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	103	90-110	

MATRIX SPIKE SAMPLE: 352043

Parameter	Units	2055854008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.16	79	75-125	

SAMPLE DUPLICATE: 352042

Parameter	Units	2055854008 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

QC Batch: 479028 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 2609946 Matrix: Water  
Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/12/17 17:52	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/12/17 17:52	
Sulfate	mg/L	<0.16	1.2	0.16	06/12/17 17:52	

LABORATORY CONTROL SAMPLE: 2609947

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.9	95	90-110	
Nitrate as N	mg/L	1	0.91	91	90-110	
Sulfate	mg/L	12.5	11.4	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2609948 2609949

Parameter	Units	10391798001		2609948		2609949		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	7.3	12.5	12.5	18.3	18.3	88	88	90-110	0	20	M1	
Nitrate as N	mg/L	6.0	1	1	6.1	6.1	13	15	90-110	0	20	M1	
Sulfate	mg/L	23.4	12.5	12.5	32.1	32.2	70	71	90-110	0	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

QC Batch: 479394 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391798001, 10391798002, 10391798003

METHOD BLANK: 2611118 Matrix: Water  
Associated Lab Samples: 10391798001, 10391798002, 10391798003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/13/17 13:08	FS

LABORATORY CONTROL SAMPLE: 2611119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.95	95	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611120 2611121

Parameter	Units	10391532001		2611120		2611121		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	0.79	1	1	1	1.7	1.7	91	93	90-110	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611122 2611123

Parameter	Units	10391532002		2611122		2611123		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	0.97	1	1	1	1.9	1.9	93	95	90-110	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

QC Batch: 479396 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391798004, 10391798005

METHOD BLANK: 2611129 Matrix: Water  
Associated Lab Samples: 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/13/17 13:44	

LABORATORY CONTROL SAMPLE: 2611130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611131 2611132

Parameter	Units	10391766001		2611131		2611132		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	7.0	5	5	5	11.8	11.6	97	94	90-110	1	20 E

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611133 2611134

Parameter	Units	10391766002		2611133		2611134		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	1.8	1	1	1	2.7	2.7	93	94	90-110	0	20 E

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 480302 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 2616335 Matrix: Water  
 Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/19/17 15:43	

LABORATORY CONTROL SAMPLE: 2616336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	288	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616337 2616338

Parameter	Units	10391445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	245	245	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616339 2616340

Parameter	Units	10391446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	237	231	95	92	90-110	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

QC Batch: 116641 Analysis Method: SM 5310C  
 QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
 Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

METHOD BLANK: 460680 Matrix: Water  
 Associated Lab Samples: 10391798001, 10391798002, 10391798003, 10391798004, 10391798005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/16/17 10:31	

LABORATORY CONTROL SAMPLE: 460681

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.3	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 460682 460683

Parameter	Units	1289470001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	9.0	25	25	34.9	35.0	104	104	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 460684 460685

Parameter	Units	10391769004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	12.7	25	25	37.9	37.6	101	100	80-120	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391798

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391798001	MW16D-GW-060717	RSK 175	479090		
10391798002	MW18D-GW-060717	RSK 175	479090		
10391798003	FD03-GW-060717	RSK 175	479090		
10391798004	MW02D-GW-060817	RSK 175	479090		
10391798005	MW01D-GW-060817	RSK 175	479090		
10391798001	MW16D-GW-060717	EPA 3010	479075	6010C Met	479698
10391798002	MW18D-GW-060717	EPA 3010	479075	6010C Met	479698
10391798003	FD03-GW-060717	EPA 3010	479075	6010C Met	479698
10391798004	MW02D-GW-060817	EPA 3010	479075	6010C Met	479698
10391798005	MW01D-GW-060817	EPA 3010	479075	6010C Met	479698
10391798001	MW16D-GW-060717	EPA 7470A	479083	EPA 7470A	480231
10391798002	MW18D-GW-060717	EPA 7470A	479083	EPA 7470A	480231
10391798003	FD03-GW-060717	EPA 7470A	479083	EPA 7470A	480231
10391798004	MW02D-GW-060817	EPA 7470A	479083	EPA 7470A	480231
10391798005	MW01D-GW-060817	EPA 7470A	479083	EPA 7470A	480231
10391798001	MW16D-GW-060717	SM 2320B	480066		
10391798002	MW18D-GW-060717	SM 2320B	480066		
10391798003	FD03-GW-060717	SM 2320B	480066		
10391798004	MW02D-GW-060817	SM 2320B	480066		
10391798005	MW01D-GW-060817	SM 2320B	480066		
10391798001	MW16D-GW-060717	SM 2540C	479329		
10391798002	MW18D-GW-060717	SM 2540C	479329		
10391798003	FD03-GW-060717	SM 2540C	479329		
10391798004	MW02D-GW-060817	SM 2540C	479533		
10391798005	MW01D-GW-060817	SM 2540C	479533		
10391798001	MW16D-GW-060717	SM 4500-S-2 D	82622		
10391798002	MW18D-GW-060717	SM 4500-S-2 D	82622		
10391798003	FD03-GW-060717	SM 4500-S-2 D	82622		
10391798004	MW02D-GW-060817	SM 4500-S-2 D	82719		
10391798005	MW01D-GW-060817	SM 4500-S-2 D	82719		
10391798001	MW16D-GW-060717	EPA 300.0	479028		
10391798002	MW18D-GW-060717	EPA 300.0	479028		
10391798003	FD03-GW-060717	EPA 300.0	479028		
10391798004	MW02D-GW-060817	EPA 300.0	479028		
10391798005	MW01D-GW-060817	EPA 300.0	479028		
10391798001	MW16D-GW-060717	EPA 353.2	479394		
10391798002	MW18D-GW-060717	EPA 353.2	479394		
10391798003	FD03-GW-060717	EPA 353.2	479394		
10391798004	MW02D-GW-060817	EPA 353.2	479396		
10391798005	MW01D-GW-060817	EPA 353.2	479396		
10391798001	MW16D-GW-060717	EPA 410.4	480302	EPA 410.4	480347
10391798002	MW18D-GW-060717	EPA 410.4	480302	EPA 410.4	480347
10391798003	FD03-GW-060717	EPA 410.4	480302	EPA 410.4	480347

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391798

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391798004	MW02D-GW-060817	EPA 410.4	480302	EPA 410.4	480347
10391798005	MW01D-GW-060817	EPA 410.4	480302	EPA 410.4	480347
10391798001	MW16D-GW-060717	SM 5310C	116641		
10391798002	MW18D-GW-060717	SM 5310C	116641		
10391798003	FD03-GW-060717	SM 5310C	116641		
10391798004	MW02D-GW-060817	SM 5310C	116641		
10391798005	MW01D-GW-060817	SM 5310C	116641		

### REPORT OF LABORATORY ANALYSIS

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**Sample Condition Upon Receipt**      Client Name: CH2M Hill      Project #: \_\_\_\_\_

WO#: **10391798**

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_

Tracking Number: 7021 4575 5429, 3790

Custody Seal on Cooler/Box Present?  Yes     No      Seals Intact?  Yes     No

Packing Material:  Bubble Wrap     Bubble Bags     None     Other: PB      Temp Blank?  Yes     No

Thermometer Used:  151401163     151401164      Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.00.4      Cooler Temp Corrected (°C): 3.10.5      Biological Tissue Frozen?  Yes     No     N/A

Temp should be above freezing to 6°C      Correction Factor: +0.1      Date and Initials of Person Examining Contents: RC/10/17

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <u>Nitrates</u>
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y (M)
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-5</u>
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____      Lot # of added preservative: _____
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**      Field Data Required?  Yes     No

Person Contacted: \_\_\_\_\_      Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Project Manager Review: JENNI GROSS      Date: 06/12/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Chain of Custody

WO#: 2056062



Workorder: 10391798

Workorder Name: 1497 UPRR\_Freeman

.017 Results Requested By: 6/26/2017

Report To		Subcontract To				Requested Analysis																											
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333				<div style="display: flex; justify-content: space-between;"> <span>5636267 / 4500 Sulfide</span> <span>LAB USE ONLY</span> </div>																											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Other															
1	MW16D-GW-060717	PS	6/7/2017 10:55	10391798001	Water													1															
2	MW18D-GW-060717	PS	6/7/2017 15:20	10391798002	Water													1															
3	FD03-GW-060717	PS	6/7/2017 08:00	10391798003	Water													1															
4	MW02D-GW-060817	PS	6/8/2017 10:15	10391798004	Water													1															
5	MW01D-GW-060817	PS	6/8/2017 12:40	10391798005	Water	1																											

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i> Pace MN	6/12/17 1115	<i>[Signature]</i>							
<i>[Signature]</i>	6/13/17	<i>[Signature]</i>	6/13/17						
	0900		0900						

Cooler Temperature on Receipt 0.7 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

# WO#: 2056062

PM: CMM

Due Date: 06/26/17

CLIENT: PASI-MINN

Project \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-14-17 JB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Chain of Custody

**WO#: 1289255**

PM: HRZ

Due Date: 06/26/17

CLIENT: PACE MPLS

Page 50 of 51

Workorder: 10391798

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/10/2017

Results Requested By: 6/26/2017

Report To	Subcontract To	Requested Analysis																
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																	
						Preserved Containers												
						F2504						5632351 / 5310 TOC						

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	F2504																LAB USE ONLY	
1	MW16D-GW-060717	PS	6/7/2017 10:55	10391798001	Water	3																	001
2	MW18D-GW-060717	PS	6/7/2017 15:20	10391798002	Water	3																	002
3	FD03-GW-060717	PS	6/7/2017 08:00	10391798003	Water	3																	003
4	MW02D-GW-060817	PS	6/8/2017 10:15	10391798004	Water	3																	004
5	MW01D-GW-060817	PS	6/8/2017 12:40	10391798005	Water	3																	005

						Comments															
Transfers	Released By	Date/Time	Received By	Date/Time																	
1	<i>[Signature]</i> Pace MN	6/12/17 11:15	<i>[Signature]</i>	6/12/17 19:00																	
2	<i>[Signature]</i>	6/12/17 22:45	<i>[Signature]</i>	6-15-17 08:00																	
3																					

Cooler Temperature on Receipt	1.9 °C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact	Y or N
-------------------------------	--------	--------------	--------	-----------------	--------	----------------	--------

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace Milk Project #: \_\_\_\_\_

**WO# : 1289255**  
 PM: HRZ Due Date: 06/26/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: hazmat Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: -1 Cooler Temp Corrected °C: 1.4 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 1.3 Date and Initials of Person Examining Contents: DK 6/17/17

Comments: MT (e-1317)

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>mt</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 6-13-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 23, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

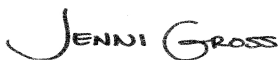
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 10, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391799001	MW16D-GW-060717	Water	06/07/17 10:55	06/10/17 09:00
10391799002	MW18D-GW-060717	Water	06/07/17 15:20	06/10/17 09:00
10391799003	FD03-GW-060717	Water	06/07/17 08:00	06/10/17 09:00
10391799004	MW02D-GW-060817	Water	06/08/17 10:15	06/10/17 09:00
10391799005	MW01D-GW-060817	Water	06/08/17 12:40	06/10/17 09:00
10391799006	TB-060817	Water	06/08/17 07:00	06/10/17 09:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391799001	MW16D-GW-060717	EPA 8260B	DJB	83	PASI-M
10391799002	MW18D-GW-060717	EPA 8260B	DJB	83	PASI-M
10391799003	FD03-GW-060717	EPA 8260B	DJB	83	PASI-M
10391799004	MW02D-GW-060817	EPA 8260B	PRD	83	PASI-M
10391799005	MW01D-GW-060817	EPA 8260B	DJB	83	PASI-M
10391799006	TB-060817	EPA 8260B	PRD	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391799001</b>	<b>MW16D-GW-060717</b>					
EPA 8260B	Acetone	9.5J	ug/L	20.0	06/15/17 18:10	CH,L3
<b>10391799002</b>	<b>MW18D-GW-060717</b>					
EPA 8260B	Acetone	50.4	ug/L	20.0	06/15/17 18:32	CH,L1
<b>10391799004</b>	<b>MW02D-GW-060817</b>					
EPA 8260B	1,2,4-Trimethylbenzene	0.092J	ug/L	0.50	06/21/17 21:26	
EPA 8260B	1,3,5-Trimethylbenzene	0.22J	ug/L	0.50	06/21/17 21:26	
EPA 8260B	Acetone	24.2	ug/L	20.0	06/21/17 21:26	L1
EPA 8260B	Benzene	0.36J	ug/L	0.50	06/21/17 21:26	
EPA 8260B	Ethylbenzene	0.14J	ug/L	0.50	06/21/17 21:26	
EPA 8260B	Toluene	0.31J	ug/L	0.50	06/21/17 21:26	
EPA 8260B	m&p-Xylene	0.13J	ug/L	1.0	06/21/17 21:26	
<b>10391799005</b>	<b>MW01D-GW-060817</b>					
EPA 8260B	Carbon disulfide	0.61J	ug/L	1.0	06/22/17 02:09	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 23, 2017

### General Information:

6 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 479772

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2613118)
  - Acetone
  - Tetrahydrofuran
- LCSD (Lab ID: 2613119)
  - Acetone
  - Tetrahydrofuran
- MW16D-GW-060717 (Lab ID: 10391799001)
  - Acetone
- MW18D-GW-060717 (Lab ID: 10391799002)
  - Acetone

QC Batch: 480976

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- MS (Lab ID: 2622142)
  - Acetone
- MSD (Lab ID: 2622143)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 23, 2017

QC Batch: 479772

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2613118)
  - Acetone
  - Tetrahydrofuran
- LCSD (Lab ID: 2613119)
  - Acetone
  - Tetrahydrofuran

QC Batch: 480843

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCSD (Lab ID: 2620252)
  - Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCSD (Lab ID: 2620252)
  - Tetrahydrofuran

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2620252)
  - Acetone
  - Tetrahydrofuran

QC Batch: 480976

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2619732)
  - Acetone
  - Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479772

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 480481

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392001003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2617135)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2617136)
  - Acetone
  - Tetrahydrofuran

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 23, 2017

QC Batch: 480843

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392969001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2620250)
  - Acetone
  - Tetrahydrofuran

QC Batch: 480976

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393392001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2622142)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2622143)
  - Acetone
  - Tetrahydrofuran

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Sample: MW16D-GW-060717 Lab ID: 10391799001 Collected: 06/07/17 10:55 Received: 06/10/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 18:10	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 18:10	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 18:10	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 18:10	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 18:10	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 18:10	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 18:10	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 18:10	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 18:10	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 18:10	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 18:10	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 18:10	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 18:10	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 18:10	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 18:10	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 18:10	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 18:10	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 18:10	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 18:10	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 18:10	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 18:10	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 18:10	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 18:10	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 18:10	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 18:10	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 18:10	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 18:10	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 18:10	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 18:10	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 18:10	108-10-1	
Acetone	9.5J	ug/L	20.0	0.64	1		06/15/17 18:10	67-64-1	CH,L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 18:10	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 18:10	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 18:10	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 18:10	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 18:10	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 18:10	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 18:10	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 18:10	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 18:10	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 18:10	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 18:10	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 18:10	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 18:10	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 18:10	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 18:10	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: MW16D-GW-060717**      **Lab ID: 10391799001**      Collected: 06/07/17 10:55      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 18:10	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 18:10	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 18:10	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 18:10	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 18:10	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 18:10	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 18:10	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 18:10	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 18:10	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 18:10	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 18:10	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 18:10	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 18:10	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 18:10	109-99-9	L3
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 18:10	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 18:10	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 18:10	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 18:10	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 18:10	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 18:10	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 18:10	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 18:10	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 18:10	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 18:10	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 18:10	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 18:10	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 18:10	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 18:10	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 18:10	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 18:10	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 18:10	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 18:10	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 18:10	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 18:10	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		06/15/17 18:10	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		06/15/17 18:10	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1		06/15/17 18:10	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Sample: **MW18D-GW-060717** Lab ID: **10391799002** Collected: 06/07/17 15:20 Received: 06/10/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 18:32	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/15/17 18:32	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 18:32	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/15/17 18:32	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/15/17 18:32	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/15/17 18:32	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/15/17 18:32	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/15/17 18:32	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/15/17 18:32	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/15/17 18:32	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/15/17 18:32	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/15/17 18:32	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/15/17 18:32	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/15/17 18:32	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/15/17 18:32	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/15/17 18:32	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/15/17 18:32	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/15/17 18:32	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/15/17 18:32	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/15/17 18:32	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/15/17 18:32	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/15/17 18:32	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/15/17 18:32	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/15/17 18:32	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/15/17 18:32	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/15/17 18:32	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/15/17 18:32	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/15/17 18:32	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/15/17 18:32	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/15/17 18:32	108-10-1	
Acetone	50.4	ug/L	20.0	0.64	1		06/15/17 18:32	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/15/17 18:32	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/15/17 18:32	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/15/17 18:32	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/15/17 18:32	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/15/17 18:32	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/15/17 18:32	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/15/17 18:32	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/15/17 18:32	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/15/17 18:32	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/15/17 18:32	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/15/17 18:32	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/15/17 18:32	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/15/17 18:32	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/15/17 18:32	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/15/17 18:32	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: MW18D-GW-060717**      **Lab ID: 10391799002**      Collected: 06/07/17 15:20      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/15/17 18:32	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/15/17 18:32	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/15/17 18:32	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/15/17 18:32	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/15/17 18:32	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/15/17 18:32	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/15/17 18:32	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/15/17 18:32	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/15/17 18:32	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/15/17 18:32	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/15/17 18:32	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/15/17 18:32	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/15/17 18:32	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/15/17 18:32	109-99-9	L3
Toluene	<0.059	ug/L	1.0	0.059	1		06/15/17 18:32	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/15/17 18:32	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/15/17 18:32	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/15/17 18:32	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/15/17 18:32	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/15/17 18:32	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/15/17 18:32	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/15/17 18:32	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/15/17 18:32	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/15/17 18:32	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/15/17 18:32	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/15/17 18:32	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/15/17 18:32	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/15/17 18:32	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/15/17 18:32	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/15/17 18:32	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/15/17 18:32	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/15/17 18:32	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/15/17 18:32	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/15/17 18:32	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		06/15/17 18:32	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1		06/15/17 18:32	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		06/15/17 18:32	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: FD03-GW-060717**      **Lab ID: 10391799003**      Collected: 06/07/17 08:00      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/20/17 04:13	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/20/17 04:13	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/20/17 04:13	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/20/17 04:13	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/20/17 04:13	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/20/17 04:13	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/20/17 04:13	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/20/17 04:13	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/20/17 04:13	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/20/17 04:13	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/20/17 04:13	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/20/17 04:13	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/20/17 04:13	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/20/17 04:13	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/20/17 04:13	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/20/17 04:13	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/20/17 04:13	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/20/17 04:13	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/20/17 04:13	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/20/17 04:13	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/20/17 04:13	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/20/17 04:13	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/20/17 04:13	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/20/17 04:13	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/20/17 04:13	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/20/17 04:13	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/20/17 04:13	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/20/17 04:13	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/20/17 04:13	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/20/17 04:13	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/20/17 04:13	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/20/17 04:13	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/20/17 04:13	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/20/17 04:13	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/20/17 04:13	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/20/17 04:13	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/20/17 04:13	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/20/17 04:13	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/20/17 04:13	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/20/17 04:13	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/20/17 04:13	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/20/17 04:13	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/20/17 04:13	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/20/17 04:13	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/20/17 04:13	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/20/17 04:13	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: FD03-GW-060717**      **Lab ID: 10391799003**      Collected: 06/07/17 08:00      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/20/17 04:13	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/20/17 04:13	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/20/17 04:13	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/20/17 04:13	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/20/17 04:13	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/20/17 04:13	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/20/17 04:13	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/20/17 04:13	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/20/17 04:13	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/20/17 04:13	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/20/17 04:13	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/20/17 04:13	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/20/17 04:13	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/20/17 04:13	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/20/17 04:13	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/20/17 04:13	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/20/17 04:13	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/20/17 04:13	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/20/17 04:13	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/20/17 04:13	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/20/17 04:13	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/20/17 04:13	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/20/17 04:13	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/20/17 04:13	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/20/17 04:13	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/20/17 04:13	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/20/17 04:13	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/20/17 04:13	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/20/17 04:13	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/20/17 04:13	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/20/17 04:13	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/20/17 04:13	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/20/17 04:13	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/20/17 04:13	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		06/20/17 04:13	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		06/20/17 04:13	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/20/17 04:13	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Sample: MW02D-GW-060817 Lab ID: 10391799004 Collected: 06/08/17 10:15 Received: 06/10/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/21/17 21:26	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/21/17 21:26	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/21/17 21:26	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/21/17 21:26	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/21/17 21:26	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/21/17 21:26	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/21/17 21:26	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/21/17 21:26	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/21/17 21:26	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/21/17 21:26	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/21/17 21:26	120-82-1	
1,2,4-Trimethylbenzene	0.092J	ug/L	0.50	0.068	1		06/21/17 21:26	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/21/17 21:26	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/21/17 21:26	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/21/17 21:26	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/21/17 21:26	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/21/17 21:26	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/21/17 21:26	78-87-5	
1,3,5-Trimethylbenzene	0.22J	ug/L	0.50	0.042	1		06/21/17 21:26	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/21/17 21:26	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/21/17 21:26	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/21/17 21:26	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/21/17 21:26	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/21/17 21:26	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/21/17 21:26	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/21/17 21:26	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/21/17 21:26	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/21/17 21:26	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/21/17 21:26	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/21/17 21:26	108-10-1	
Acetone	24.2	ug/L	20.0	0.64	1		06/21/17 21:26	67-64-1	L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/21/17 21:26	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/21/17 21:26	107-13-1	
Benzene	0.36J	ug/L	0.50	0.042	1		06/21/17 21:26	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/21/17 21:26	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/21/17 21:26	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/21/17 21:26	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/21/17 21:26	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/21/17 21:26	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/21/17 21:26	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/21/17 21:26	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/21/17 21:26	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/21/17 21:26	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/21/17 21:26	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/21/17 21:26	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/21/17 21:26	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Sample: MW02D-GW-060817 Lab ID: 10391799004 Collected: 06/08/17 10:15 Received: 06/10/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/21/17 21:26	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/21/17 21:26	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/21/17 21:26	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/21/17 21:26	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/21/17 21:26	637-92-3	
Ethylbenzene	0.14J	ug/L	0.50	0.075	1		06/21/17 21:26	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/21/17 21:26	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/21/17 21:26	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/21/17 21:26	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/21/17 21:26	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/21/17 21:26	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/21/17 21:26	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/21/17 21:26	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/21/17 21:26	109-99-9	
Toluene	0.31J	ug/L	0.50	0.059	1		06/21/17 21:26	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/21/17 21:26	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/21/17 21:26	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/21/17 21:26	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/21/17 21:26	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/21/17 21:26	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/21/17 21:26	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/21/17 21:26	10061-01-5	
m&p-Xylene	0.13J	ug/L	1.0	0.11	1		06/21/17 21:26	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/21/17 21:26	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/21/17 21:26	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/21/17 21:26	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/21/17 21:26	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/21/17 21:26	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/21/17 21:26	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/21/17 21:26	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/21/17 21:26	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/21/17 21:26	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/21/17 21:26	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/21/17 21:26	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		06/21/17 21:26	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/21/17 21:26	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/21/17 21:26	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: MW01D-GW-060817**      **Lab ID: 10391799005**      Collected: 06/08/17 12:40      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 02:09	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/22/17 02:09	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:09	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 02:09	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/22/17 02:09	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:09	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/22/17 02:09	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/22/17 02:09	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/22/17 02:09	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/22/17 02:09	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/22/17 02:09	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/22/17 02:09	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/22/17 02:09	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/22/17 02:09	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/22/17 02:09	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/22/17 02:09	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/22/17 02:09	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/22/17 02:09	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/22/17 02:09	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/22/17 02:09	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/22/17 02:09	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/22/17 02:09	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/22/17 02:09	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/22/17 02:09	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/22/17 02:09	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/22/17 02:09	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/22/17 02:09	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/22/17 02:09	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/22/17 02:09	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/22/17 02:09	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/22/17 02:09	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/22/17 02:09	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/22/17 02:09	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/22/17 02:09	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/22/17 02:09	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/22/17 02:09	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/22/17 02:09	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/22/17 02:09	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/22/17 02:09	74-83-9	
Carbon disulfide	0.61J	ug/L	1.0	0.20	1		06/22/17 02:09	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/22/17 02:09	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/22/17 02:09	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/22/17 02:09	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/22/17 02:09	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/22/17 02:09	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/22/17 02:09	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: MW01D-GW-060817**      **Lab ID: 10391799005**      Collected: 06/08/17 12:40      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/22/17 02:09	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/22/17 02:09	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/22/17 02:09	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/22/17 02:09	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/22/17 02:09	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/22/17 02:09	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/22/17 02:09	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/22/17 02:09	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/22/17 02:09	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/22/17 02:09	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/22/17 02:09	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/22/17 02:09	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/22/17 02:09	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/22/17 02:09	109-99-9	L1
Toluene	<0.059	ug/L	0.50	0.059	1		06/22/17 02:09	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/22/17 02:09	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:09	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/22/17 02:09	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/22/17 02:09	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/22/17 02:09	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/22/17 02:09	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/22/17 02:09	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/22/17 02:09	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/22/17 02:09	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/22/17 02:09	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/22/17 02:09	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/22/17 02:09	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/22/17 02:09	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/22/17 02:09	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/22/17 02:09	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/22/17 02:09	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/22/17 02:09	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/22/17 02:09	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/22/17 02:09	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		06/22/17 02:09	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/22/17 02:09	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		06/22/17 02:09	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: TB-060817**      **Lab ID: 10391799006**      Collected: 06/08/17 07:00      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/21/17 21:04	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/21/17 21:04	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/21/17 21:04	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/21/17 21:04	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/21/17 21:04	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/21/17 21:04	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/21/17 21:04	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/21/17 21:04	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/21/17 21:04	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/21/17 21:04	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/21/17 21:04	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/21/17 21:04	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/21/17 21:04	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/21/17 21:04	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/21/17 21:04	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/21/17 21:04	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/21/17 21:04	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/21/17 21:04	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/21/17 21:04	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/21/17 21:04	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/21/17 21:04	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/21/17 21:04	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/21/17 21:04	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/21/17 21:04	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/21/17 21:04	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/21/17 21:04	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/21/17 21:04	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/21/17 21:04	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/21/17 21:04	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/21/17 21:04	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/21/17 21:04	67-64-1	L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/21/17 21:04	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/21/17 21:04	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/21/17 21:04	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/21/17 21:04	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/21/17 21:04	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/21/17 21:04	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/21/17 21:04	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/21/17 21:04	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/21/17 21:04	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/21/17 21:04	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/21/17 21:04	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/21/17 21:04	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/21/17 21:04	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/21/17 21:04	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/21/17 21:04	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

**Sample: TB-060817**      **Lab ID: 10391799006**      Collected: 06/08/17 07:00      Received: 06/10/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/21/17 21:04	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/21/17 21:04	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/21/17 21:04	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/21/17 21:04	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/21/17 21:04	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/21/17 21:04	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/21/17 21:04	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/21/17 21:04	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/21/17 21:04	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/21/17 21:04	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/21/17 21:04	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/21/17 21:04	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/21/17 21:04	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/21/17 21:04	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/21/17 21:04	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/21/17 21:04	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/21/17 21:04	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/21/17 21:04	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/21/17 21:04	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/21/17 21:04	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/21/17 21:04	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/21/17 21:04	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/21/17 21:04	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/21/17 21:04	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/21/17 21:04	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/21/17 21:04	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/21/17 21:04	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/21/17 21:04	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/21/17 21:04	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/21/17 21:04	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/21/17 21:04	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/21/17 21:04	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/21/17 21:04	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/21/17 21:04	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		06/21/17 21:04	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/21/17 21:04	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		06/21/17 21:04	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

QC Batch: 479772 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391799001, 10391799002

METHOD BLANK: 2613117 Matrix: Water  
Associated Lab Samples: 10391799001, 10391799002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/15/17 10:53	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/15/17 10:53	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/15/17 10:53	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/15/17 10:53	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/15/17 10:53	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/15/17 10:53	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/15/17 10:53	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/15/17 10:53	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/15/17 10:53	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/15/17 10:53	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/15/17 10:53	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/15/17 10:53	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/15/17 10:53	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/15/17 10:53	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/15/17 10:53	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/15/17 10:53	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/15/17 10:53	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/15/17 10:53	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/15/17 10:53	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/15/17 10:53	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/15/17 10:53	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/15/17 10:53	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/15/17 10:53	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/15/17 10:53	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/15/17 10:53	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/15/17 10:53	
Acetone	ug/L	<0.64	20.0	0.64	06/15/17 10:53	
Acrolein	ug/L	<2.1	10.0	2.1	06/15/17 10:53	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/15/17 10:53	
Benzene	ug/L	<0.042	0.50	0.042	06/15/17 10:53	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/15/17 10:53	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/15/17 10:53	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/15/17 10:53	
Bromoform	ug/L	<0.11	4.0	0.11	06/15/17 10:53	
Bromomethane	ug/L	<0.20	4.0	0.20	06/15/17 10:53	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/15/17 10:53	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/15/17 10:53	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

METHOD BLANK: 2613117 Matrix: Water

Associated Lab Samples: 10391799001, 10391799002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/15/17 10:53	
Chloroethane	ug/L	<0.12	1.0	0.12	06/15/17 10:53	
Chloroform	ug/L	<0.21	1.0	0.21	06/15/17 10:53	
Chloromethane	ug/L	<0.080	4.0	0.080	06/15/17 10:53	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/15/17 10:53	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/15/17 10:53	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/15/17 10:53	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/15/17 10:53	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/15/17 10:53	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/15/17 10:53	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/15/17 10:53	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/15/17 10:53	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/15/17 10:53	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/15/17 10:53	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/15/17 10:53	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/15/17 10:53	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/15/17 10:53	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/15/17 10:53	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/15/17 10:53	
Naphthalene	ug/L	<0.064	1.0	0.064	06/15/17 10:53	
o-Xylene	ug/L	<0.044	0.50	0.044	06/15/17 10:53	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/15/17 10:53	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/15/17 10:53	
Styrene	ug/L	<0.056	0.50	0.056	06/15/17 10:53	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/15/17 10:53	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/15/17 10:53	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/15/17 10:53	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/15/17 10:53	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/15/17 10:53	
Toluene	ug/L	<0.059	1.0	0.059	06/15/17 10:53	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/15/17 10:53	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/15/17 10:53	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/15/17 10:53	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/15/17 10:53	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/15/17 10:53	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/15/17 10:53	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/15/17 10:53	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/15/17 10:53	
1,2-Dichloroethane-d4 (S)	%	96	75-137		06/15/17 10:53	
4-Bromofluorobenzene (S)	%	97	75-125		06/15/17 10:53	
Toluene-d8 (S)	%	96	75-125		06/15/17 10:53	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE & LCSD: 2613118		2613119								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.1	21.8	111	109	75-136	1	30	
1,1,1-Trichloroethane	ug/L	20	21.5	20.9	107	104	75-129	3	30	
1,1,2,2-Tetrachloroethane	ug/L	20	19.1	19.0	96	95	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	19.1	19.0	95	95	75-125	0	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.9	21.6	109	108	69-126	1	30	
1,1-Dichloroethane	ug/L	20	20.2	20.1	101	101	75-125	0	30	
1,1-Dichloroethene	ug/L	20	20.9	20.7	105	104	75-125	1	30	
1,1-Dichloropropene	ug/L	20	21.3	21.4	106	107	75-125	1	30	
1,2,3-Trichlorobenzene	ug/L	20	19.0	19.8	95	99	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	19.7	19.6	99	98	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	19.4	19.8	97	99	75-125	2	30	
1,2,4-Trimethylbenzene	ug/L	20	19.2	19.3	96	96	75-125	0	30	
1,2-Dibromo-3-chloropropane	ug/L	50	47.8	47.3	96	95	71-130	1	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.8	21.0	104	105	75-125	1	30	
1,2-Dichlorobenzene	ug/L	20	21.0	21.1	105	106	75-125	1	30	
1,2-Dichloroethane	ug/L	20	19.4	19.6	97	98	70-125	1	30	
1,2-Dichloroethene (Total)	ug/L	40	41.4	41.0	103	103	75-125	1	30	
1,2-Dichloropropane	ug/L	20	20.3	20.1	101	100	75-125	1	30	
1,3,5-Trimethylbenzene	ug/L	20	20.6	20.6	103	103	75-125	0	30	
1,3-Dichlorobenzene	ug/L	20	20.7	20.3	104	101	75-125	2	30	
1,3-Dichloropropane	ug/L	20	20.5	20.4	102	102	75-125	0	30	
1,4-Dichlorobenzene	ug/L	20	20.1	20.2	101	101	75-125	0	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	399	427	100	107	64-140	7	30	
2,2,4-Trimethylpentane	ug/L	20	20.8	20.9	104	104	68-125	1	30	
2,2-Dichloropropane	ug/L	20	22.9	22.7	115	113	70-131	1	30	
2-Butanone (MEK)	ug/L	100	96.2	94.6	96	95	69-125	2	30	
2-Chlorotoluene	ug/L	20	20.1	20.0	101	100	75-125	1	30	
2-Hexanone	ug/L	100	99.4	98.7	99	99	73-129	1	30	
4-Chlorotoluene	ug/L	20	20.2	20.1	101	101	75-125	0	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.4	96.7	98	97	73-125	2	30	
Acetone	ug/L	100	142	137	142	137	66-126	4	30	CH,L1
Acrolein	ug/L	200	216	216	108	108	56-150	0	30	
Acrylonitrile	ug/L	200	195	194	97	97	68-129	1	30	
Benzene	ug/L	20	19.0	19.0	95	95	75-125	0	30	
Bromobenzene	ug/L	20	19.9	20.2	99	101	75-125	2	30	
Bromochloromethane	ug/L	20	21.5	21.9	107	109	75-126	2	30	
Bromodichloromethane	ug/L	20	21.1	20.9	106	104	75-133	1	30	
Bromoform	ug/L	20	20.6	20.6	103	103	62-142	0	30	
Bromomethane	ug/L	20	21.4	22.4	107	112	34-143	5	30	
Carbon disulfide	ug/L	20	20.1	19.6	100	98	71-125	2	30	
Carbon tetrachloride	ug/L	20	24.1	23.4	121	117	71-145	3	30	
Chlorobenzene	ug/L	20	20.1	20.3	101	102	75-125	1	30	
Chloroethane	ug/L	20	20.9	21.1	104	105	75-125	1	30	
Chloroform	ug/L	20	20.2	20.0	101	100	75-125	1	30	
Chloromethane	ug/L	20	20.1	20.1	100	100	54-125	0	30	
cis-1,2-Dichloroethene	ug/L	20	20.7	20.5	104	102	75-125	1	30	
cis-1,3-Dichloropropene	ug/L	20	20.4	20.5	102	103	75-125	0	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE & LCSD: 2613118			2613119								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.3	20.7	101	104	74-141	2	30		
Dibromomethane	ug/L	20	22.4	22.8	112	114	75-125	2	30		
Dichlorodifluoromethane	ug/L	20	19.4	18.9	97	95	59-130	2	30		
Dichlorofluoromethane	ug/L	20	21.2	21.1	106	105	75-125	0	30		
Diisopropyl ether	ug/L	20	19.6	19.7	98	98	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.6	20.0	98	100	73-125	2	30		
Ethylbenzene	ug/L	20	20.0	19.7	100	98	75-125	1	30		
Hexachloro-1,3-butadiene	ug/L	20	23.4	23.7	117	119	75-131	1	30		
Isopropylbenzene (Cumene)	ug/L	20	21.5	21.1	108	105	75-125	2	30		
m&p-Xylene	ug/L	40	42.7	42.1	107	105	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	19.8	20.1	99	101	75-125	1	30		
Methylene Chloride	ug/L	20	18.7	18.7	93	93	73-125	0	30		
n-Butylbenzene	ug/L	20	21.6	20.7	108	103	75-125	4	30		
n-Propylbenzene	ug/L	20	19.9	19.4	99	97	75-125	3	30		
Naphthalene	ug/L	20	17.8	18.2	89	91	74-125	2	30		
o-Xylene	ug/L	20	21.3	21.3	107	106	75-125	0	30		
p-Isopropyltoluene	ug/L	20	20.0	19.8	100	99	75-125	1	30		
sec-Butylbenzene	ug/L	20	21.2	21.0	106	105	75-125	1	30		
Styrene	ug/L	20	19.7	19.4	98	97	75-125	1	30		
tert-Amylmethyl ether	ug/L	20	18.0	18.4	90	92	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	219	221	110	110	69-131	1	30		
tert-Butylbenzene	ug/L	20	20.7	20.5	103	103	75-125	1	30		
Tetrachloroethene	ug/L	20	21.2	20.9	106	105	75-125	1	30		
Tetrahydrofuran	ug/L	200	302	267	151	133	65-127	12	30	CH,L1	
Toluene	ug/L	20	18.0	17.8	90	89	75-125	1	30		
trans-1,2-Dichloroethene	ug/L	20	20.7	20.6	103	103	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	20	20.5	20.6	102	103	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	48.3	47.8	97	96	30-150	1	30		
Trichloroethene	ug/L	20	20.5	20.3	102	102	75-125	1	30		
Trichlorofluoromethane	ug/L	20	22.4	22.1	112	110	71-140	1	30		
Vinyl acetate	ug/L	20	20.9	20.6	104	103	68-137	1	30		
Vinyl chloride	ug/L	20	20.6	20.7	103	104	70-125	0	30		
Xylene (Total)	ug/L	60	64.0	63.4	107	106	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				93	93	75-137				
4-Bromofluorobenzene (S)	%				96	96	75-125				
Toluene-d8 (S)	%				96	97	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

QC Batch: 480481

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10391799003

METHOD BLANK: 2617133

Matrix: Water

Associated Lab Samples: 10391799003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/19/17 21:20	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/19/17 21:20	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/19/17 21:20	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/19/17 21:20	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/19/17 21:20	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/19/17 21:20	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/19/17 21:20	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/19/17 21:20	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/19/17 21:20	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/19/17 21:20	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/19/17 21:20	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/19/17 21:20	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/19/17 21:20	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/19/17 21:20	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/19/17 21:20	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/19/17 21:20	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/19/17 21:20	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/19/17 21:20	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/19/17 21:20	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/19/17 21:20	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/19/17 21:20	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/19/17 21:20	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/19/17 21:20	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/19/17 21:20	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/19/17 21:20	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/19/17 21:20	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/19/17 21:20	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/19/17 21:20	
Acetone	ug/L	<0.64	20.0	0.64	06/19/17 21:20	
Acrolein	ug/L	<2.1	10.0	2.1	06/19/17 21:20	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/19/17 21:20	
Benzene	ug/L	<0.042	0.50	0.042	06/19/17 21:20	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/19/17 21:20	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/19/17 21:20	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/19/17 21:20	
Bromoform	ug/L	<0.11	4.0	0.11	06/19/17 21:20	
Bromomethane	ug/L	<0.20	4.0	0.20	06/19/17 21:20	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/19/17 21:20	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/19/17 21:20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

METHOD BLANK: 2617133 Matrix: Water  
Associated Lab Samples: 10391799003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/19/17 21:20	
Chloroethane	ug/L	<0.12	1.0	0.12	06/19/17 21:20	
Chloroform	ug/L	<0.21	1.0	0.21	06/19/17 21:20	
Chloromethane	ug/L	<0.080	4.0	0.080	06/19/17 21:20	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/19/17 21:20	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/19/17 21:20	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/19/17 21:20	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/19/17 21:20	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/19/17 21:20	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/19/17 21:20	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/19/17 21:20	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/19/17 21:20	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/19/17 21:20	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/19/17 21:20	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/19/17 21:20	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/19/17 21:20	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/19/17 21:20	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/19/17 21:20	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/19/17 21:20	
Naphthalene	ug/L	<0.064	1.0	0.064	06/19/17 21:20	
o-Xylene	ug/L	<0.044	0.50	0.044	06/19/17 21:20	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/19/17 21:20	
Styrene	ug/L	<0.056	0.50	0.056	06/19/17 21:20	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/19/17 21:20	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/19/17 21:20	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/19/17 21:20	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/19/17 21:20	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/19/17 21:20	
Toluene	ug/L	<0.059	0.50	0.059	06/19/17 21:20	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/19/17 21:20	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/19/17 21:20	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/19/17 21:20	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/19/17 21:20	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/19/17 21:20	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/19/17 21:20	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/19/17 21:20	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/19/17 21:20	
1,2-Dichloroethane-d4 (S)	%	99	75-137		06/19/17 21:20	
4-Bromofluorobenzene (S)	%	101	75-125		06/19/17 21:20	
Toluene-d8 (S)	%	101	75-125		06/19/17 21:20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE: 2617134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.9	105	75-136	
1,1,1-Trichloroethane	ug/L	20	20.7	104	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.5	103	71-138	
1,1,2-Trichloroethane	ug/L	20	21.3	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.5	107	69-126	
1,1-Dichloroethane	ug/L	20	19.9	100	75-125	
1,1-Dichloroethene	ug/L	20	21.6	108	75-125	
1,1-Dichloropropene	ug/L	20	20.1	101	75-125	
1,2,3-Trichlorobenzene	ug/L	20	21.9	109	75-125	
1,2,3-Trichloropropane	ug/L	20	20.7	103	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.5	107	75-125	
1,2,4-Trimethylbenzene	ug/L	20	20.8	104	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	54.2	108	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	22.5	112	75-125	
1,2-Dichlorobenzene	ug/L	20	21.0	105	75-125	
1,2-Dichloroethane	ug/L	20	19.9	100	70-125	
1,2-Dichloroethene (Total)	ug/L	40	41.7	104	75-125	
1,2-Dichloropropane	ug/L	20	19.2	96	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.9	105	75-125	
1,3-Dichlorobenzene	ug/L	20	21.8	109	75-125	
1,3-Dichloropropane	ug/L	20	20.1	101	75-125	
1,4-Dichlorobenzene	ug/L	20	20.5	102	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	421	105	64-140	
2,2,4-Trimethylpentane	ug/L	20	21.7	108	68-125	
2,2-Dichloropropane	ug/L	20	19.7	99	70-131	
2-Butanone (MEK)	ug/L	100	93.2	93	69-125	
2-Chlorotoluene	ug/L	20	20.4	102	75-125	
2-Hexanone	ug/L	100	102	102	73-129	
4-Chlorotoluene	ug/L	20	21.2	106	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	101	101	73-125	
Acetone	ug/L	100	107	107	66-126	
Acrolein	ug/L	200	227	114	56-150	
Acrylonitrile	ug/L	200	202	101	68-129	
Benzene	ug/L	20	20.6	103	75-125	
Bromobenzene	ug/L	20	21.7	108	75-125	
Bromochloromethane	ug/L	20	21.8	109	75-126	
Bromodichloromethane	ug/L	20	21.5	108	75-133	
Bromoform	ug/L	20	18.3	92	62-142	
Bromomethane	ug/L	20	21.6	108	34-143	
Carbon disulfide	ug/L	20	21.3	107	71-125	
Carbon tetrachloride	ug/L	20	21.8	109	71-145	
Chlorobenzene	ug/L	20	20.6	103	75-125	
Chloroethane	ug/L	20	21.8	109	75-125	
Chloroform	ug/L	20	19.8	99	75-125	
Chloromethane	ug/L	20	20.5	102	54-125	
cis-1,2-Dichloroethene	ug/L	20	20.3	101	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE: 2617134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.8	109	74-141	
Dibromomethane	ug/L	20	21.2	106	75-125	
Dichlorodifluoromethane	ug/L	20	22.8	114	59-130	
Dichlorofluoromethane	ug/L	20	21.1	106	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	21.6	108	73-125	
Ethylbenzene	ug/L	20	19.2	96	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.8	109	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.4	102	75-125	
m&p-Xylene	ug/L	40	39.8	99	75-125	
Methyl-tert-butyl ether	ug/L	20	20.3	101	75-125	
Methylene Chloride	ug/L	20	19.1	96	73-125	
n-Butylbenzene	ug/L	20	21.7	108	75-125	
n-Propylbenzene	ug/L	20	19.8	99	75-125	
Naphthalene	ug/L	20	20.5	102	74-125	
o-Xylene	ug/L	20	20.2	101	75-125	
p-Isopropyltoluene	ug/L	20	20.0	100	75-125	
sec-Butylbenzene	ug/L	20	20.4	102	75-125	
Styrene	ug/L	20	21.6	108	75-125	
tert-Amylmethyl ether	ug/L	20	22.0	110	71-126	
tert-Butyl Alcohol	ug/L	200	216	108	69-131	
tert-Butylbenzene	ug/L	20	19.9	99	75-125	
Tetrachloroethene	ug/L	20	21.6	108	75-125	
Tetrahydrofuran	ug/L	200	215	107	65-127	
Toluene	ug/L	20	20.7	104	75-125	
trans-1,2-Dichloroethene	ug/L	20	21.4	107	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.9	99	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	50.6	101	30-150	
Trichloroethene	ug/L	20	20.8	104	75-125	
Trichlorofluoromethane	ug/L	20	21.7	109	71-140	
Vinyl acetate	ug/L	20	22.9	115	68-137	
Vinyl chloride	ug/L	20	22.2	111	70-125	
Xylene (Total)	ug/L	60	60.0	100	75-125	
1,2-Dichloroethane-d4 (S)	%			99	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2617135 2617136

Parameter	Units	2617135		2617136		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10392001003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	19.1	20.6	96	103	75-137	7	30	
1,1,1-Trichloroethane	ug/L	<0.057	20	20	19.8	21.5	99	107	75-139	8	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	19.6	21.1	98	106	60-142	8	30	
1,1,2-Trichloroethane	ug/L	<0.064	20	20	19.7	21.4	98	107	75-128	9	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Parameter	Units	10392001003		2617135		2617136		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	22.3	23.4	111	117	62-150	5	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	19.6	20.7	98	104	70-129	6	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	21.2	22.3	106	112	67-141	5	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	20.2	21.8	101	109	64-144	7	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	20.0	21.3	100	106	66-139	6	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.3	20.4	97	102	69-134	6	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	19.9	20.6	99	103	65-138	3	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	18.9	20.6	95	103	65-143	9	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	48.2	52.2	96	104	61-134	8	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	20.0	21.5	100	107	74-129	7	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	18.7	20.1	94	101	68-135	7	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	18.2	19.2	91	96	73-125	5	30		
1,2-Dichloroethene (Total)	ug/L	0.21J	40	40	38.6	40.9	96	102	69-134	6	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	18.6	19.9	93	99	64-130	7	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	19.0	20.6	95	103	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	19.4	21.5	97	107	69-135	10	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.4	19.9	97	100	67-128	2	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	18.6	20.0	93	100	66-134	7	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	343	378	86	95	58-140	10	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	21.3	22.3	107	111	48-150	4	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	20.1	20.9	100	104	50-150	4	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	87.5	90.5	87	90	58-125	3	30		
2-Chlorotoluene	ug/L	<0.084	20	20	18.8	20.5	94	103	65-138	9	30		
2-Hexanone	ug/L	<0.19	100	100	98.9	105	99	105	61-134	6	30		
4-Chlorotoluene	ug/L	<0.048	20	20	19.8	21.0	99	105	68-135	6	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	96.4	103	96	103	61-130	6	30		
Acetone	ug/L	4.3J	100	100	158	169	154	165	51-140	7	30	M1	
Acrolein	ug/L	<2.1	200	200	275	289	138	145	48-150	5	30		
Acrylonitrile	ug/L	<0.49	200	200	186	197	93	98	55-134	6	30		
Benzene	ug/L	<0.042	20	20	18.9	20.1	95	100	63-132	6	30		
Bromobenzene	ug/L	<0.087	20	20	19.5	21.1	98	105	67-138	8	30		
Bromochloromethane	ug/L	<0.082	20	20	20.8	21.0	104	105	66-138	1	30		
Bromodichloromethane	ug/L	<0.068	20	20	19.7	20.4	98	102	75-137	3	30		
Bromoform	ug/L	<0.11	20	20	17.5	18.4	87	92	65-129	5	30		
Bromomethane	ug/L	<0.20	20	20	22.8	22.4	114	112	41-150	2	30		
Carbon disulfide	ug/L	<0.20	20	20	20.0	21.2	100	106	72-132	6	30		
Carbon tetrachloride	ug/L	<0.079	20	20	19.9	21.4	100	107	75-150	7	30		
Chlorobenzene	ug/L	<0.066	20	20	18.7	20.0	93	100	73-127	7	30		
Chloroethane	ug/L	<0.12	20	20	22.5	22.4	113	112	74-138	1	30		
Chloroform	ug/L	<0.21	20	20	19.2	20.0	96	100	74-125	4	30		
Chloromethane	ug/L	<0.080	20	20	20.2	19.7	101	98	58-129	3	30		
cis-1,2-Dichloroethene	ug/L	0.21J	20	20	19.6	20.3	97	100	63-135	3	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.1	19.9	95	100	66-129	4	30		
Dibromochloromethane	ug/L	<0.048	20	20	19.2	20.5	96	102	75-133	6	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Parameter	Units	10392001003		2617135		2617136		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<0.14	20	20	19.8	20.9	99	104	68-134	5	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	23.1	23.1	116	115	72-150	0	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	21.6	21.6	108	108	75-129	0	30		
Diisopropyl ether	ug/L	<0.050	20	20	18.5	19.4	93	97	62-128	5	30		
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	18.9	20.2	94	101	63-132	7	30		
Ethylbenzene	ug/L	<0.075	20	20	18.7	20.0	94	100	72-130	7	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	20.8	22.1	104	110	71-150	6	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	19.7	20.9	98	105	70-136	6	30		
m&p-Xylene	ug/L	<0.11	40	40	38.0	40.9	95	102	64-142	7	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.2	20.2	96	101	72-125	5	30		
Methylene Chloride	ug/L	<0.097	20	20	18.2	19.0	91	95	60-132	4	30		
n-Butylbenzene	ug/L	<0.16	20	20	20.8	22.2	104	111	60-150	6	30		
n-Propylbenzene	ug/L	<0.049	20	20	19.0	20.6	95	103	63-142	8	30		
Naphthalene	ug/L	<0.064	20	20	19.6	20.8	98	104	67-125	6	30		
o-Xylene	ug/L	<0.044	20	20	19.7	20.8	98	104	60-143	6	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	19.7	21.1	99	105	64-146	7	30		
sec-Butylbenzene	ug/L	<0.094	20	20	19.8	21.4	99	107	67-144	8	30		
Styrene	ug/L	<0.056	20	20	19.7	20.7	99	104	67-136	5	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	18.9	19.6	95	98	60-134	3	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	195	206	98	103	56-146	5	30		
tert-Butylbenzene	ug/L	<0.051	20	20	18.9	20.5	94	103	68-135	9	30		
Tetrachloroethene	ug/L	<0.13	20	20	20.2	22.0	101	110	67-148	8	30		
Tetrahydrofuran	ug/L	<1.5	200	200	292	304	146	152	51-141	4	30	M1	
Toluene	ug/L	<0.059	20	20	19.5	20.4	97	102	61-140	5	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	19.0	20.6	95	103	62-138	8	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	18.7	19.8	93	99	67-134	6	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	45.3	46.7	91	93	30-150	3	30		
Trichloroethene	ug/L	<0.044	20	20	20.0	21.1	100	105	64-149	5	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	23.9	23.6	119	118	75-150	1	30		
Vinyl acetate	ug/L	<0.12	20	20	19.8	20.5	99	103	49-143	4	30		
Vinyl chloride	ug/L	<0.098	20	20	23.3	22.7	116	113	75-133	3	30		
Xylene (Total)	ug/L	<0.15	60	60	57.7	61.7	96	103	63-142	7	30		
1,2-Dichloroethane-d4 (S)	%						97	98	75-137				
4-Bromofluorobenzene (S)	%						100	101	75-125				
Toluene-d8 (S)	%						101	101	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

QC Batch: 480843 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391799004, 10391799006

METHOD BLANK: 2619000 Matrix: Water  
Associated Lab Samples: 10391799004, 10391799006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/21/17 12:20	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/21/17 12:20	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/21/17 12:20	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/21/17 12:20	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/21/17 12:20	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/21/17 12:20	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/21/17 12:20	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/21/17 12:20	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/21/17 12:20	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/21/17 12:20	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/21/17 12:20	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/21/17 12:20	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/21/17 12:20	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/21/17 12:20	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/21/17 12:20	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/21/17 12:20	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/21/17 12:20	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/21/17 12:20	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/21/17 12:20	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/21/17 12:20	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/21/17 12:20	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/21/17 12:20	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/21/17 12:20	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/21/17 12:20	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/21/17 12:20	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/21/17 12:20	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/21/17 12:20	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/21/17 12:20	
Acetone	ug/L	<0.64	20.0	0.64	06/21/17 12:20	
Acrolein	ug/L	<2.1	10.0	2.1	06/21/17 12:20	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/21/17 12:20	
Benzene	ug/L	<0.042	0.50	0.042	06/21/17 12:20	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/21/17 12:20	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/21/17 12:20	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/21/17 12:20	
Bromoform	ug/L	<0.11	4.0	0.11	06/21/17 12:20	
Bromomethane	ug/L	<0.20	4.0	0.20	06/21/17 12:20	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/21/17 12:20	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/21/17 12:20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

METHOD BLANK: 2619000

Matrix: Water

Associated Lab Samples: 10391799004, 10391799006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/21/17 12:20	
Chloroethane	ug/L	<0.12	1.0	0.12	06/21/17 12:20	
Chloroform	ug/L	<0.21	1.0	0.21	06/21/17 12:20	
Chloromethane	ug/L	<0.080	4.0	0.080	06/21/17 12:20	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/21/17 12:20	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/21/17 12:20	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/21/17 12:20	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/21/17 12:20	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/21/17 12:20	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/21/17 12:20	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/21/17 12:20	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/21/17 12:20	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/21/17 12:20	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/21/17 12:20	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/21/17 12:20	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/21/17 12:20	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/21/17 12:20	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/21/17 12:20	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/21/17 12:20	
Naphthalene	ug/L	<0.064	1.0	0.064	06/21/17 12:20	
o-Xylene	ug/L	<0.044	0.50	0.044	06/21/17 12:20	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/21/17 12:20	
Styrene	ug/L	<0.056	0.50	0.056	06/21/17 12:20	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/21/17 12:20	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/21/17 12:20	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/21/17 12:20	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/21/17 12:20	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/21/17 12:20	
Toluene	ug/L	<0.059	0.50	0.059	06/21/17 12:20	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/21/17 12:20	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/21/17 12:20	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/21/17 12:20	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/21/17 12:20	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/21/17 12:20	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/21/17 12:20	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/21/17 12:20	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/21/17 12:20	
1,2-Dichloroethane-d4 (S)	%	101	75-137		06/21/17 12:20	
4-Bromofluorobenzene (S)	%	100	75-125		06/21/17 12:20	
Toluene-d8 (S)	%	99	75-125		06/21/17 12:20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE & LCSD: 2619001		2620252									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.1	19.2	101	96	75-136	5	30		
1,1,1-Trichloroethane	ug/L	20	19.2	17.5	96	88	75-129	9	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.5	20.8	102	104	71-138	2	30		
1,1,2-Trichloroethane	ug/L	20	20.8	21.1	104	106	75-125	2	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.5	15.4	88	77	69-126	13	30		
1,1-Dichloroethane	ug/L	20	18.6	17.2	93	86	75-125	8	30		
1,1-Dichloroethene	ug/L	20	18.3	16.6	92	83	75-125	10	30		
1,1-Dichloropropene	ug/L	20	17.7	16.2	88	81	75-125	9	30		
1,2,3-Trichlorobenzene	ug/L	20	20.0	20.0	100	100	75-125	0	30		
1,2,3-Trichloropropane	ug/L	20	21.1	21.0	105	105	75-125	1	30		
1,2,4-Trichlorobenzene	ug/L	20	20.3	19.5	102	97	75-125	4	30		
1,2,4-Trimethylbenzene	ug/L	20	19.2	18.6	96	93	75-125	3	30		
1,2-Dibromo-3-chloropropane	ug/L	50	49.7	52.0	99	104	71-130	5	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.8	20.8	104	104	75-125	0	30		
1,2-Dichlorobenzene	ug/L	20	19.1	19.1	95	96	75-125	0	30		
1,2-Dichloroethane	ug/L	20	18.8	18.1	94	91	70-125	4	30		
1,2-Dichloroethene (Total)	ug/L	40	35.9	33.5	90	84	75-125	7	30		
1,2-Dichloropropane	ug/L	20	19.0	18.3	95	91	75-125	4	30		
1,3,5-Trimethylbenzene	ug/L	20	18.9	18.1	94	91	75-125	4	30		
1,3-Dichlorobenzene	ug/L	20	19.8	19.8	99	99	75-125	0	30		
1,3-Dichloropropane	ug/L	20	20.1	19.5	101	97	75-125	3	30		
1,4-Dichlorobenzene	ug/L	20	18.7	18.8	94	94	75-125	0	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	379	405	95	101	64-140	7	30		
2,2,4-Trimethylpentane	ug/L	20	17.6	14.6	88	73	68-125	19	30		
2,2-Dichloropropane	ug/L	20	19.3	16.2	97	81	70-131	18	30		
2-Butanone (MEK)	ug/L	100	97.1	90.6	97	91	69-125	7	30		
2-Chlorotoluene	ug/L	20	18.5	18.1	93	90	75-125	3	30		
2-Hexanone	ug/L	100	104	104	104	104	73-129	0	30		
4-Chlorotoluene	ug/L	20	19.3	19.0	96	95	75-125	1	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	101	103	101	103	73-125	2	30		
Acetone	ug/L	100	113	163	113	163	66-126	36	30	L1,R1	
Acrolein	ug/L	200	197	252	98	126	56-150	24	30		
Acrylonitrile	ug/L	200	191	190	96	95	68-129	1	30		
Benzene	ug/L	20	17.9	16.8	90	84	75-125	7	30		
Bromobenzene	ug/L	20	19.4	20.3	97	101	75-125	4	30		
Bromochloromethane	ug/L	20	19.6	19.8	98	99	75-126	1	30		
Bromodichloromethane	ug/L	20	20.3	19.9	102	99	75-133	2	30		
Bromoform	ug/L	20	18.9	18.9	94	94	62-142	0	30		
Bromomethane	ug/L	20	16.1	16.0	80	80	34-143	1	30		
Carbon disulfide	ug/L	20	16.4	14.8	82	74	71-125	10	30		
Carbon tetrachloride	ug/L	20	18.7	17.0	94	85	71-145	10	30		
Chlorobenzene	ug/L	20	18.9	18.3	95	92	75-125	3	30		
Chloroethane	ug/L	20	20.3	18.6	102	93	75-125	9	30		
Chloroform	ug/L	20	18.2	18.0	91	90	75-125	1	30		
Chloromethane	ug/L	20	18.1	17.4	91	87	54-125	4	30		
cis-1,2-Dichloroethene	ug/L	20	18.1	17.5	91	88	75-125	3	30		
cis-1,3-Dichloropropene	ug/L	20	19.2	18.2	96	91	75-125	5	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE & LCSD: 2619001		2620252								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.3	19.6	102	98	74-141	4	30	
Dibromomethane	ug/L	20	20.0	20.0	100	100	75-125	0	30	
Dichlorodifluoromethane	ug/L	20	18.1	16.4	90	82	59-130	10	30	
Dichlorofluoromethane	ug/L	20	19.5	17.6	97	88	75-125	10	30	
Diisopropyl ether	ug/L	20	18.2	17.7	91	89	69-125	3	30	
Ethyl-tert-butyl ether	ug/L	20	18.9	18.0	94	90	73-125	5	30	
Ethylbenzene	ug/L	20	18.2	17.6	91	88	75-125	4	30	
Hexachloro-1,3-butadiene	ug/L	20	21.2	19.7	106	98	75-131	7	30	
Isopropylbenzene (Cumene)	ug/L	20	18.8	18.6	94	93	75-125	1	30	
m&p-Xylene	ug/L	40	37.3	36.3	93	91	75-125	3	30	
Methyl-tert-butyl ether	ug/L	20	19.4	18.9	97	94	75-125	3	30	
Methylene Chloride	ug/L	20	18.1	17.7	91	89	73-125	2	30	
n-Butylbenzene	ug/L	20	20.4	18.8	102	94	75-125	9	30	
n-Propylbenzene	ug/L	20	18.8	17.9	94	90	75-125	5	30	
Naphthalene	ug/L	20	19.1	20.0	95	100	74-125	5	30	
o-Xylene	ug/L	20	18.9	18.8	94	94	75-125	0	30	
p-Isopropyltoluene	ug/L	20	19.8	18.6	99	93	75-125	6	30	
sec-Butylbenzene	ug/L	20	19.3	18.4	97	92	75-125	5	30	
Styrene	ug/L	20	19.4	19.4	97	97	75-125	0	30	
tert-Amylmethyl ether	ug/L	20	18.6	18.2	93	91	71-126	2	30	
tert-Butyl Alcohol	ug/L	200	206	214	103	107	69-131	4	30	
tert-Butylbenzene	ug/L	20	18.4	17.7	92	89	75-125	4	30	
Tetrachloroethene	ug/L	20	18.8	18.2	94	91	75-125	4	30	
Tetrahydrofuran	ug/L	200	179	306	90	153	65-127	52	30	L3,R1
Toluene	ug/L	20	18.7	18.1	93	90	75-125	4	30	
trans-1,2-Dichloroethene	ug/L	20	17.8	16.0	89	80	75-125	11	30	
trans-1,3-Dichloropropene	ug/L	20	19.7	18.9	99	95	75-125	4	30	
trans-1,4-Dichloro-2-butene	ug/L	50	49.0	47.7	98	95	30-150	3	30	
Trichloroethene	ug/L	20	18.4	17.6	92	88	75-125	4	30	
Trichlorofluoromethane	ug/L	20	18.4	16.6	92	83	71-140	10	30	
Vinyl acetate	ug/L	20	20.6	19.0	103	95	68-137	8	30	
Vinyl chloride	ug/L	20	19.6	17.9	98	89	70-125	10	30	
Xylene (Total)	ug/L	60	56.2	55.1	94	92	75-125	2	30	
1,2-Dichloroethane-d4 (S)	%				100	98	75-137			
4-Bromofluorobenzene (S)	%				100	100	75-125			
Toluene-d8 (S)	%				103	100	75-125			

MATRIX SPIKE SAMPLE: 2620250		10392969001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20.2	101	75-137	
1,1,1-Trichloroethane	ug/L	<0.057	20	20.6	103	75-139	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20.9	104	60-142	
1,1,2-Trichloroethane	ug/L	<0.064	20	21.0	105	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	22.7	113	62-150	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

MATRIX SPIKE SAMPLE:	2620250	10392969001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.055	20	19.3	96	70-129	
1,1-Dichloroethene	ug/L	<0.069	20	20.2	101	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	19.7	98	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	19.8	99	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	21.1	106	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	19.8	99	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	19.5	97	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50.1	100	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20.6	103	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	19.5	97	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	18.6	93	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.16	40	37.0	92	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	19.6	98	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	19.5	97	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	20.7	104	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	19.6	98	67-128	
1,4-Dichlorobenzene	ug/L	<0.081	20	19.2	96	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	407	102	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	19.8	99	48-150	
2,2-Dichloropropane	ug/L	<0.096	20	18.9	94	50-150	
2-Butanone (MEK)	ug/L	<1.1	100	89.8	90	58-125	
2-Chlorotoluene	ug/L	<0.084	20	19.4	97	65-138	
2-Hexanone	ug/L	<0.19	100	105	105	61-134	
4-Chlorotoluene	ug/L	<0.048	20	20.0	100	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	104	104	61-130	
Acetone	ug/L	10.8J	100	159	149	51-140	M1
Acrolein	ug/L	<2.1	200	277	138	48-150	
Acrylonitrile	ug/L	<0.49	200	193	96	55-134	
Benzene	ug/L	<0.042	20	18.3	92	63-132	
Bromobenzene	ug/L	<0.087	20	20.4	102	67-138	
Bromochloromethane	ug/L	<0.082	20	20.2	101	66-138	
Bromodichloromethane	ug/L	<0.068	20	20.8	104	75-137	
Bromoform	ug/L	<0.11	20	18.4	92	65-129	
Bromomethane	ug/L	<0.20	20	15.5	77	41-150	
Carbon disulfide	ug/L	<0.20	20	17.4	87	72-132	
Carbon tetrachloride	ug/L	<0.079	20	21.0	105	75-150	
Chlorobenzene	ug/L	<0.066	20	19.3	96	73-127	
Chloroethane	ug/L	<0.12	20	21.0	105	74-138	
Chloroform	ug/L	<0.21	20	19.5	97	74-125	
Chloromethane	ug/L	<0.080	20	19.0	95	58-129	
cis-1,2-Dichloroethene	ug/L	<0.12	20	18.4	92	63-135	
cis-1,3-Dichloropropene	ug/L	<0.069	20	18.3	91	66-129	
Dibromochloromethane	ug/L	<0.048	20	19.9	99	75-133	
Dibromomethane	ug/L	<0.14	20	20.2	101	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	25.1	125	72-150	
Dichlorofluoromethane	ug/L	<0.054	20	20.1	101	75-129	
Diisopropyl ether	ug/L	<0.050	20	18.4	92	62-128	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

MATRIX SPIKE SAMPLE: 2620250		10392969001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	18.6	93	63-132	
Ethylbenzene	ug/L	<0.075	20	19.1	95	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20.5	103	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20.2	101	70-136	
m&p-Xylene	ug/L	<0.11	40	39.0	98	64-142	
Methyl-tert-butyl ether	ug/L	0.12J	20	19.3	96	72-125	
Methylene Chloride	ug/L	<0.097	20	18.2	91	60-132	
n-Butylbenzene	ug/L	<0.16	20	20.8	104	60-150	
n-Propylbenzene	ug/L	<0.049	20	19.9	100	63-142	
Naphthalene	ug/L	<0.064	20	19.4	97	67-125	
o-Xylene	ug/L	<0.044	20	19.6	98	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	20.4	102	64-146	
sec-Butylbenzene	ug/L	<0.094	20	20.4	102	67-144	
Styrene	ug/L	<0.056	20	19.9	99	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	18.5	92	60-134	
tert-Butyl Alcohol	ug/L	15.6	200	264	124	56-146	
tert-Butylbenzene	ug/L	<0.051	20	19.3	96	68-135	
Tetrachloroethene	ug/L	<0.13	20	20.6	103	67-148	
Tetrahydrofuran	ug/L	<1.5	200	292	146	51-141 M1	
Toluene	ug/L	<0.059	20	19.6	98	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	18.6	93	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	18.8	94	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	47.6	95	30-150	
Trichloroethene	ug/L	<0.044	20	19.9	100	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	22.7	113	75-150	
Vinyl acetate	ug/L	<0.12	20	17.6	88	49-143	
Vinyl chloride	ug/L	<0.098	20	21.2	106	75-133	
Xylene (Total)	ug/L	<0.15	60	58.6	98	63-142	
1,2-Dichloroethane-d4 (S)	%				100	75-137	
4-Bromofluorobenzene (S)	%				99	75-125	
Toluene-d8 (S)	%				100	75-125	

SAMPLE DUPLICATE: 2620251

Parameter	Units	10392969002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

SAMPLE DUPLICATE: 2620251

Parameter	Units	10392969002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	<0.16	<0.16		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	<1.1	<1.1		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	24.6	30.5	21	30	L1
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	<0.20	<0.20		30	
Carbon tetrachloride	ug/L	<0.079	<0.079		30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	<0.21	<0.21		30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

SAMPLE DUPLICATE: 2620251

Parameter	Units	10392969002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	<0.064	<0.064		30	
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	<0.059	<0.059		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	105	104	1		
4-Bromofluorobenzene (S)	%	101	103	3		
Toluene-d8 (S)	%	99	98	0		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

QC Batch: 480976 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391799005

METHOD BLANK: 2619731 Matrix: Water  
Associated Lab Samples: 10391799005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/22/17 00:41	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/22/17 00:41	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/22/17 00:41	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/22/17 00:41	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/22/17 00:41	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/22/17 00:41	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/22/17 00:41	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/22/17 00:41	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/22/17 00:41	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/22/17 00:41	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/22/17 00:41	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/22/17 00:41	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/22/17 00:41	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/22/17 00:41	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/22/17 00:41	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/22/17 00:41	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/22/17 00:41	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/22/17 00:41	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/22/17 00:41	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/22/17 00:41	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/22/17 00:41	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/22/17 00:41	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/22/17 00:41	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/22/17 00:41	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/22/17 00:41	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/22/17 00:41	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/22/17 00:41	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/22/17 00:41	
Acetone	ug/L	<0.64	20.0	0.64	06/22/17 00:41	
Acrolein	ug/L	<2.1	10.0	2.1	06/22/17 00:41	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/22/17 00:41	
Benzene	ug/L	<0.042	0.50	0.042	06/22/17 00:41	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/22/17 00:41	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/22/17 00:41	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/22/17 00:41	
Bromoform	ug/L	<0.11	4.0	0.11	06/22/17 00:41	
Bromomethane	ug/L	<0.20	4.0	0.20	06/22/17 00:41	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/22/17 00:41	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/22/17 00:41	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

METHOD BLANK: 2619731

Matrix: Water

Associated Lab Samples: 10391799005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/22/17 00:41	
Chloroethane	ug/L	<0.12	1.0	0.12	06/22/17 00:41	
Chloroform	ug/L	<0.21	1.0	0.21	06/22/17 00:41	
Chloromethane	ug/L	<0.080	4.0	0.080	06/22/17 00:41	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/22/17 00:41	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/22/17 00:41	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/22/17 00:41	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/22/17 00:41	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/22/17 00:41	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/22/17 00:41	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/22/17 00:41	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/22/17 00:41	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/22/17 00:41	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/22/17 00:41	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/22/17 00:41	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/22/17 00:41	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/22/17 00:41	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/22/17 00:41	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/22/17 00:41	
Naphthalene	ug/L	<0.064	1.0	0.064	06/22/17 00:41	
o-Xylene	ug/L	<0.044	0.50	0.044	06/22/17 00:41	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/22/17 00:41	
Styrene	ug/L	<0.056	0.50	0.056	06/22/17 00:41	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/22/17 00:41	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/22/17 00:41	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/22/17 00:41	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/22/17 00:41	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/22/17 00:41	
Toluene	ug/L	<0.059	0.50	0.059	06/22/17 00:41	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/22/17 00:41	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/22/17 00:41	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/22/17 00:41	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/22/17 00:41	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/22/17 00:41	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/22/17 00:41	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/22/17 00:41	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/22/17 00:41	
1,2-Dichloroethane-d4 (S)	%	102	75-137		06/22/17 00:41	
4-Bromofluorobenzene (S)	%	100	75-125		06/22/17 00:41	
Toluene-d8 (S)	%	99	75-125		06/22/17 00:41	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE: 2619732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.7	103	75-136	
1,1,1-Trichloroethane	ug/L	20	18.9	94	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	22.3	112	71-138	
1,1,2-Trichloroethane	ug/L	20	22.1	111	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.6	88	69-126	
1,1-Dichloroethane	ug/L	20	18.9	94	75-125	
1,1-Dichloroethene	ug/L	20	18.3	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	75-125	
1,2,3-Trichloropropane	ug/L	20	22.0	110	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.2	96	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.2	96	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.6	107	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	22.3	112	75-125	
1,2-Dichlorobenzene	ug/L	20	20.2	101	75-125	
1,2-Dichloroethane	ug/L	20	20.1	100	70-125	
1,2-Dichloroethene (Total)	ug/L	40	36.2	90	75-125	
1,2-Dichloropropane	ug/L	20	19.6	98	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.7	94	75-125	
1,3-Dichlorobenzene	ug/L	20	20.7	104	75-125	
1,3-Dichloropropane	ug/L	20	21.1	106	75-125	
1,4-Dichlorobenzene	ug/L	20	19.7	98	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	385	96	64-140	
2,2,4-Trimethylpentane	ug/L	20	14.8	74	68-125	
2,2-Dichloropropane	ug/L	20	17.4	87	70-131	
2-Butanone (MEK)	ug/L	100	99.8	100	69-125	
2-Chlorotoluene	ug/L	20	19.1	95	75-125	
2-Hexanone	ug/L	100	111	111	73-129	
4-Chlorotoluene	ug/L	20	19.6	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	73-125	
Acetone	ug/L	100	144	144	66-126	L1
Acrolein	ug/L	200	229	114	56-150	
Acrylonitrile	ug/L	200	210	105	68-129	
Benzene	ug/L	20	18.0	90	75-125	
Bromobenzene	ug/L	20	21.2	106	75-125	
Bromochloromethane	ug/L	20	20.3	101	75-126	
Bromodichloromethane	ug/L	20	21.3	107	75-133	
Bromoform	ug/L	20	19.4	97	62-142	
Bromomethane	ug/L	20	16.4	82	34-143	
Carbon disulfide	ug/L	20	15.7	78	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	19.0	95	75-125	
Chloroethane	ug/L	20	20.4	102	75-125	
Chloroform	ug/L	20	19.3	97	75-125	
Chloromethane	ug/L	20	18.1	91	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.4	92	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.0	100	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

LABORATORY CONTROL SAMPLE: 2619732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.1	106	74-141	
Dibromomethane	ug/L	20	22.0	110	75-125	
Dichlorodifluoromethane	ug/L	20	17.9	89	59-130	
Dichlorofluoromethane	ug/L	20	19.5	97	75-125	
Diisopropyl ether	ug/L	20	19.3	96	69-125	
Ethyl-tert-butyl ether	ug/L	20	19.8	99	73-125	
Ethylbenzene	ug/L	20	18.3	91	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.0	95	75-125	
m&p-Xylene	ug/L	40	38.0	95	75-125	
Methyl-tert-butyl ether	ug/L	20	21.0	105	75-125	
Methylene Chloride	ug/L	20	18.8	94	73-125	
n-Butylbenzene	ug/L	20	18.8	94	75-125	
n-Propylbenzene	ug/L	20	18.3	92	75-125	
Naphthalene	ug/L	20	20.0	100	74-125	
o-Xylene	ug/L	20	19.8	99	75-125	
p-Isopropyltoluene	ug/L	20	18.7	94	75-125	
sec-Butylbenzene	ug/L	20	18.0	90	75-125	
Styrene	ug/L	20	20.4	102	75-125	
tert-Amylmethyl ether	ug/L	20	20.0	100	71-126	
tert-Butyl Alcohol	ug/L	200	207	103	69-131	
tert-Butylbenzene	ug/L	20	18.1	90	75-125	
Tetrachloroethene	ug/L	20	18.4	92	75-125	
Tetrahydrofuran	ug/L	200	281	141	65-127 L1	
Toluene	ug/L	20	18.7	93	75-125	
trans-1,2-Dichloroethene	ug/L	20	17.7	89	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.9	100	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.1	98	30-150	
Trichloroethene	ug/L	20	18.8	94	75-125	
Trichlorofluoromethane	ug/L	20	17.9	90	71-140	
Vinyl acetate	ug/L	20	20.6	103	68-137	
Vinyl chloride	ug/L	20	19.1	96	70-125	
Xylene (Total)	ug/L	60	57.9	96	75-125	
1,2-Dichloroethane-d4 (S)	%			100	75-137	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			99	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2622142 2622143

Parameter	Units	2622142		2622143		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	21.2	21.1	106	106	75-137	0	30	
1,1,1-Trichloroethane	ug/L	<0.057	20	20	21.5	21.7	108	108	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	21.8	21.1	109	106	60-142	3	30	
1,1,2-Trichloroethane	ug/L	<0.064	20	20	21.9	22.2	109	111	75-128	1	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

Parameter	Units	2622142		2622143		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10393392001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	23.6	23.9	118	120	62-150	1	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	20.0	20.5	100	103	70-129	2	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	22.8	22.4	114	112	67-141	2	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	20.3	20.3	101	101	64-144	0	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	20.1	18.7	101	93	66-139	7	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	21.8	20.3	109	102	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	19.6	18.2	98	91	65-138	8	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	20.7	19.7	104	99	65-143	5	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	54.9	54.8	110	110	61-134	0	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	23.0	22.6	115	113	74-129	2	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	20.7	19.7	104	98	68-135	5	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	19.7	20.1	99	101	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	40.8	41.7	102	104	69-134	2	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	20.0	19.4	100	97	64-130	3	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	20.3	19.1	101	95	64-146	6	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	21.5	21.1	108	106	69-135	2	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	20.4	19.9	102	100	67-128	2	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	20.2	19.8	101	99	66-134	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	462	442	116	110	58-140	5	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	19.1	19.5	95	97	48-150	2	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	19.4	18.8	97	94	50-150	3	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	95.8	96.3	96	96	58-125	0	30		
2-Chlorotoluene	ug/L	<0.084	20	20	21.1	19.9	106	99	65-138	6	30		
2-Hexanone	ug/L	<0.19	100	100	110	110	110	110	61-134	0	30		
4-Chlorotoluene	ug/L	<0.048	20	20	21.5	20.1	108	100	68-135	7	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	109	108	109	108	61-130	1	30		
Acetone	ug/L	5.2J	100	100	173	168	168	162	51-140	3	30	CH <sub>3</sub> MO	
Acrolein	ug/L	<2.1	200	200	288	287	144	144	48-150	0	30		
Acrylonitrile	ug/L	<0.49	200	200	200	204	100	102	55-134	2	30		
Benzene	ug/L	<0.042	20	20	20.5	20.5	102	102	63-132	0	30		
Bromobenzene	ug/L	<0.087	20	20	21.7	21.3	109	107	67-138	2	30		
Bromochloromethane	ug/L	<0.082	20	20	21.0	21.1	105	106	66-138	0	30		
Bromodichloromethane	ug/L	<0.068	20	20	22.2	21.3	111	106	75-137	4	30		
Bromoform	ug/L	<0.11	20	20	17.6	17.9	88	90	65-129	2	30		
Bromomethane	ug/L	<0.20	20	20	20.9	22.0	105	110	41-150	5	30		
Carbon disulfide	ug/L	<0.20	20	20	22.1	21.8	111	109	72-132	2	30		
Carbon tetrachloride	ug/L	<0.079	20	20	22.2	21.5	111	108	75-150	3	30		
Chlorobenzene	ug/L	<0.066	20	20	20.9	20.4	104	102	73-127	2	30		
Chloroethane	ug/L	<0.12	20	20	22.8	23.3	114	116	74-138	2	30		
Chloroform	ug/L	<0.21	20	20	19.8	20.0	99	100	74-125	1	30		
Chloromethane	ug/L	<0.080	20	20	22.1	21.8	111	109	58-129	2	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	20.1	20.3	100	101	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.4	19.1	97	95	66-129	2	30		
Dibromochloromethane	ug/L	<0.048	20	20	21.7	21.6	109	108	75-133	0	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

Parameter	Units	2622142		2622143		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10393392001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.14	20	20	21.8	21.7	109	109	68-134	1	30	
Dichlorodifluoromethane	ug/L	<0.075	20	20	26.7	27.5	134	137	72-150	3	30	
Dichlorofluoromethane	ug/L	<0.054	20	20	22.2	22.3	111	112	75-129	0	30	
Diisopropyl ether	ug/L	<0.050	20	20	20.9	21.3	105	107	62-128	2	30	
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	21.0	21.1	105	105	63-132	0	30	
Ethylbenzene	ug/L	<0.075	20	20	19.2	19.1	96	96	72-130	0	30	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	20.3	17.8	102	89	71-150	13	30	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	20.1	19.5	101	97	70-136	3	30	
m&p-Xylene	ug/L	<0.11	40	40	40.1	39.6	100	99	64-142	1	30	
Methyl-tert-butyl ether	ug/L	<0.047	20	20	20.3	20.3	101	102	72-125	0	30	
Methylene Chloride	ug/L	<0.097	20	20	19.5	19.3	98	96	60-132	1	30	
n-Butylbenzene	ug/L	<0.16	20	20	20.6	19.3	103	97	60-150	7	30	
n-Propylbenzene	ug/L	<0.049	20	20	19.8	19.0	99	95	63-142	4	30	
Naphthalene	ug/L	<0.064	20	20	20.0	19.4	100	97	67-125	3	30	
o-Xylene	ug/L	<0.044	20	20	20.2	19.9	101	99	60-143	2	30	
p-Isopropyltoluene	ug/L	<0.064	20	20	19.6	18.2	98	91	64-146	8	30	
sec-Butylbenzene	ug/L	<0.094	20	20	20.3	18.7	102	94	67-144	8	30	
Styrene	ug/L	<0.056	20	20	21.6	21.2	108	106	67-136	2	30	
tert-Amylmethyl ether	ug/L	<0.073	20	20	21.3	21.2	106	106	60-134	0	30	
tert-Butyl Alcohol	ug/L	<0.89	200	200	220	232	110	116	56-146	5	30	
tert-Butylbenzene	ug/L	<0.051	20	20	19.6	18.1	98	91	68-135	8	30	
Tetrachloroethene	ug/L	<0.13	20	20	22.4	21.9	112	109	67-148	2	30	
Tetrahydrofuran	ug/L	<1.5	200	200	316	310	158	155	51-141	2	30	MO
Toluene	ug/L	<0.059	20	20	21.4	20.8	107	104	61-140	3	30	
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	20.8	21.5	104	107	62-138	3	30	
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	19.5	19.5	98	98	67-134	0	30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	50.7	48.0	101	96	30-150	5	30	
Trichloroethene	ug/L	<0.044	20	20	21.3	20.6	107	103	64-149	3	30	
Trichlorofluoromethane	ug/L	<0.055	20	20	24.3	24.1	122	121	75-150	1	30	
Vinyl acetate	ug/L	<0.12	20	20	20.0	19.7	100	99	49-143	1	30	
Vinyl chloride	ug/L	<0.098	20	20	23.7	23.9	119	120	75-133	1	30	
Xylene (Total)	ug/L	<0.15	60	60	60.3	59.5	101	99	63-142	1	30	
1,2-Dichloroethane-d4 (S)	%						98	100	75-137			
4-Bromofluorobenzene (S)	%						102	100	75-125			
Toluene-d8 (S)	%						99	101	75-125			

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391799

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 479772

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391799

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391799001	MW16D-GW-060717	EPA 8260B	479772		
10391799002	MW18D-GW-060717	EPA 8260B	479772		
10391799003	FD03-GW-060717	EPA 8260B	480481		
10391799004	MW02D-GW-060817	EPA 8260B	480843		
10391799005	MW01D-GW-060817	EPA 8260B	480976		
10391799006	TB-060817	EPA 8260B	480843		

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## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10391799

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:	Page: <span style="border: 1px solid black; padding: 2px;">  </span> Of <span style="border: 1px solid black; padding: 2px;">  </span>
Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR	
Email: mark.Ochsner@ch2n.com	Purchase Order #:	Address: CAS	Regulatory Agency
Phone: _____ Fax: _____	Project Name: UPRR_Freeman	Pace Quote:	State / Location
Requested Due Date/Circle: 24 Hour / 5 Day / <u>10 Day</u>	Project #: 1497	Pace Project Manager:	WA / Freeman
		Pace Profile #: 36447 / 4	

ITEM #	SAMPLE ID <small>One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique</small>	MATRIX <small>Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS</small>	CODE <small>(see valid codes to left)</small>	SAMPLE TYPE <small>(G=GRAB C=COMP)</small>	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Y/N	Requested Analysis: Filtered (Y/N)							Residual Chlorine (Y/N)										
					START	END			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Na2S2O3	Methanol		Other	Analyses Test	Low Level VOCs by 8260	6010/7470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS		TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	BOD 10360W	COD 410.4	CSIA of CTET (8260 Must be analyzed)				
					DATE	TIME			DATE	TIME																								
1	MW16D-GW-060717	WTG			6/17	1055	3			X																								001
2	MW18D-GW-060717				6/17	1520	3			X																							002	
3	FDO3-GW-060717				6/7/17	0800	3			X																							Field Def 003	
4	MW02D-GW-060817				6/8/17	1015	3			X																							004	
5	MW01D-GW-060817				6/8/17	1240	3			X																							005	
6	TB-060817				6/8/17	0700	2			X																							Trip Blank 006	
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	ZKB/CH2M	6/9/17	0635	Jay Pace	6/10/17	9:00	3.1	Y	Y	Y
							0.5			

<b>SAMPLER NAME AND SIGNATURE:</b>		TEMP in C Received on ice (Y/N) Custody Sealed Cooler (Y/N) Samples Intact (Y/N)
PRINT Name of SAMPLER: <b>L.K. Baumann</b>		
SIGNATURE of SAMPLER: <i>L.K. Baumann</i>	DATE Signed: <b>6-8-17</b>	



Document Name:  
**Sample Condition Upon Receipt Form**

Document No.:  
**F-MN-L-213-rev.20**

Document Revised: 19Dec2016  
Page 1 of 2

Issuing Authority:  
Pace Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: CH2M Hill Project #: \_\_\_\_\_

**WO#: 10391799**

10391799

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7021 4575 5429, 3790

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.00.4 Cooler Temp Corrected (°C): 3.10.5 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: RG 6/10/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: <u>VOA</u> , Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>040317-3055</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Field Data Required?  Yes  No  
 Comments/Resolution: \_\_\_\_\_

**Project Manager Review:**

JENNI GROSS

Date: 06/12/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers).



June 26, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

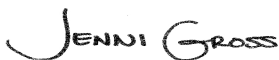
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391914001	MW05D-GW-060917	Water	06/09/17 09:35	06/13/17 08:10
10391914002	MW03D-GW-060917	Water	06/09/17 12:18	06/13/17 08:10
10391914003	MW14D-GW-060917	Water	06/09/17 14:34	06/13/17 08:10
10391914004	MW04D-GW-060917	Water	06/09/17 17:55	06/13/17 08:10

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391914001	MW05D-GW-060917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391914002	MW03D-GW-060917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391914003	MW14D-GW-060917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10391914004	MW04D-GW-060917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	KEO	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10391914001</b>	<b>MW05D-GW-060917</b>					
RSK 175	Methane	1.8J	ug/L	10.0	06/14/17 08:29	
6010C Met	Barium, Dissolved	89.4	ug/L	10.0	06/20/17 13:02	
6010C Met	Calcium, Dissolved	46800	ug/L	500	06/20/17 13:02	
6010C Met	Cobalt, Dissolved	0.81J	ug/L	10.0	06/20/17 13:02	
6010C Met	Magnesium, Dissolved	14100	ug/L	500	06/20/17 13:02	
6010C Met	Manganese, Dissolved	20.6	ug/L	5.0	06/20/17 13:02	
6010C Met	Potassium, Dissolved	2990	ug/L	2500	06/20/17 13:02	
6010C Met	Sodium, Dissolved	23600	ug/L	1000	06/20/17 13:02	
6010C Met	Vanadium, Dissolved	4.2J	ug/L	15.0	06/20/17 13:02	
6010C Met	Zinc, Dissolved	1.6J	ug/L	20.0	06/20/17 13:02	
SM 2320B	Alkalinity, Total as CaCO3	213	mg/L	5.0	06/20/17 10:58	
SM 2540C	Total Dissolved Solids	276	mg/L	10.0	06/14/17 14:48	
EPA 300.0	Chloride	2.2	mg/L	1.2	06/13/17 22:38	
EPA 300.0	Nitrate as N	0.53	mg/L	0.10	06/13/17 22:38	H3,M1
EPA 300.0	Sulfate	5.4	mg/L	1.2	06/13/17 22:38	M1
EPA 353.2	Nitrogen, NO2 plus NO3	0.59	mg/L	0.020	06/13/17 13:37	
SM 5310C	Total Organic Carbon	0.84J	mg/L	1.0	06/16/17 16:14	
<b>10391914002</b>	<b>MW03D-GW-060917</b>					
RSK 175	Methane	2.6J	ug/L	10.0	06/14/17 08:36	
6010C Met	Barium, Dissolved	41.2	ug/L	10.0	06/20/17 13:04	
6010C Met	Calcium, Dissolved	30400	ug/L	500	06/20/17 13:04	
6010C Met	Chromium, Dissolved	5.0J	ug/L	10.0	06/20/17 13:04	
6010C Met	Cobalt, Dissolved	0.82J	ug/L	10.0	06/20/17 13:04	
6010C Met	Iron, Dissolved	59.3	ug/L	50.0	06/20/17 13:04	
6010C Met	Magnesium, Dissolved	9030	ug/L	500	06/20/17 13:04	
6010C Met	Manganese, Dissolved	12.9	ug/L	5.0	06/20/17 13:04	
6010C Met	Nickel, Dissolved	4.1J	ug/L	20.0	06/20/17 13:04	
6010C Met	Potassium, Dissolved	1190J	ug/L	2500	06/20/17 13:04	
6010C Met	Sodium, Dissolved	12800	ug/L	1000	06/20/17 13:04	
6010C Met	Vanadium, Dissolved	1.6J	ug/L	15.0	06/20/17 13:04	
6010C Met	Zinc, Dissolved	16.2J	ug/L	20.0	06/20/17 13:04	
SM 2320B	Alkalinity, Total as CaCO3	143	mg/L	5.0	06/20/17 11:42	
SM 2540C	Total Dissolved Solids	194	mg/L	10.0	06/14/17 14:48	
EPA 300.0	Chloride	1.4	mg/L	1.2	06/13/17 23:40	
EPA 300.0	Nitrate as N	0.14	mg/L	0.10	06/13/17 23:40	H3
EPA 300.0	Sulfate	2.8	mg/L	1.2	06/13/17 23:40	
EPA 353.2	Nitrogen, NO2 plus NO3	0.17	mg/L	0.020	06/13/17 13:38	
SM 5310C	Total Organic Carbon	0.32J	mg/L	1.0	06/16/17 16:27	
<b>10391914003</b>	<b>MW14D-GW-060917</b>					
RSK 175	Methane	2.1J	ug/L	10.0	06/14/17 08:43	
6010C Met	Aluminum, Dissolved	17.0J	ug/L	200	06/20/17 13:14	
6010C Met	Barium, Dissolved	28.4	ug/L	10.0	06/20/17 13:14	
6010C Met	Calcium, Dissolved	31100	ug/L	500	06/20/17 13:14	
6010C Met	Cobalt, Dissolved	1.4J	ug/L	10.0	06/20/17 13:14	
6010C Met	Iron, Dissolved	128	ug/L	50.0	06/20/17 13:14	
6010C Met	Magnesium, Dissolved	9490	ug/L	500	06/20/17 13:14	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391914003</b>	<b>MW14D-GW-060917</b>					
6010C Met	Manganese, Dissolved	431	ug/L	5.0	06/20/17 13:14	
6010C Met	Potassium, Dissolved	504J	ug/L	2500	06/20/17 13:14	
6010C Met	Sodium, Dissolved	22500	ug/L	1000	06/20/17 13:14	
6010C Met	Vanadium, Dissolved	5.2J	ug/L	15.0	06/20/17 13:14	
6010C Met	Zinc, Dissolved	6.2J	ug/L	20.0	06/20/17 13:14	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	154	mg/L	5.0	06/20/17 11:46	
SM 2540C	Total Dissolved Solids	242	mg/L	10.0	06/14/17 14:48	
SM 4500-S-2 D	Sulfide, Total	0.0067J	mg/L	0.020	06/15/17 16:29	
EPA 300.0	Chloride	2.1	mg/L	1.2	06/13/17 23:56	
EPA 300.0	Nitrate as N	0.050J	mg/L	0.10	06/13/17 23:56	H3
EPA 300.0	Sulfate	17.6	mg/L	1.2	06/13/17 23:56	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	0.035	mg/L	0.020	06/13/17 13:41	
SM 5310C	Total Organic Carbon	3.2	mg/L	1.0	06/16/17 16:40	
<b>10391914004</b>	<b>MW04D-GW-060917</b>					
RSK 175	Methane	1.9J	ug/L	10.0	06/14/17 08:50	
6010C Met	Barium, Dissolved	48.5	ug/L	10.0	06/20/17 13:17	
6010C Met	Calcium, Dissolved	40100	ug/L	500	06/20/17 13:17	
6010C Met	Cobalt, Dissolved	0.85J	ug/L	10.0	06/20/17 13:17	
6010C Met	Magnesium, Dissolved	13600	ug/L	500	06/20/17 13:17	
6010C Met	Manganese, Dissolved	6.6	ug/L	5.0	06/20/17 13:17	
6010C Met	Potassium, Dissolved	3090	ug/L	2500	06/20/17 13:17	
6010C Met	Sodium, Dissolved	19200	ug/L	1000	06/20/17 13:17	
6010C Met	Vanadium, Dissolved	10.4J	ug/L	15.0	06/20/17 13:17	
6010C Met	Zinc, Dissolved	18.4J	ug/L	20.0	06/20/17 13:17	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	189	mg/L	5.0	06/20/17 11:51	M1
SM 2540C	Total Dissolved Solids	262	mg/L	10.0	06/14/17 14:48	
EPA 300.0	Chloride	6.4	mg/L	1.2	06/14/17 00:11	
EPA 300.0	Nitrate as N	1.5	mg/L	0.10	06/14/17 00:11	H3
EPA 300.0	Sulfate	16.7	mg/L	1.2	06/14/17 00:11	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	1.6	mg/L	0.020	06/13/17 13:42	
SM 5310C	Total Organic Carbon	1.0	mg/L	1.0	06/16/17 16:54	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 480556

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10391914004,10392089002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2617524)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2617525)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

### General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.

- MW03D-GW-060917 (Lab ID: 10391914002)
- MW04D-GW-060917 (Lab ID: 10391914004)
- MW05D-GW-060917 (Lab ID: 10391914001)
- MW14D-GW-060917 (Lab ID: 10391914003)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 479410

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10391914001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2611189)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2611190)
  - Nitrate as N
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

---

**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 479396

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2611131)
  - Nitrogen, NO2 plus NO3
- MS (Lab ID: 2611133)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2611132)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2611134)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

**General Information:**

4 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

**Sample:** MW05D-GW-060917    **Lab ID:** 10391914001    Collected: 06/09/17 09:35    Received: 06/13/17 08:10    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/14/17 08:29	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/14/17 08:29	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		06/14/17 08:29	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:02	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:02	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:02	7440-38-2	
Barium, Dissolved	89.4	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:02	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:02	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:02	7440-43-9	
Calcium, Dissolved	46800	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:02	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:02	7440-47-3	
Cobalt, Dissolved	0.81J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:02	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:02	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:02	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:02	7439-92-1	
Magnesium, Dissolved	14100	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:02	7439-95-4	
Manganese, Dissolved	20.6	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:02	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:02	7440-02-0	
Potassium, Dissolved	2990	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:02	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:02	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:02	7440-22-4	
Sodium, Dissolved	23600	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:02	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:02	7440-28-0	
Vanadium, Dissolved	4.2J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:02	7440-62-2	
Zinc, Dissolved	1.6J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:02	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/22/17 12:44	06/25/17 16:24	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	213	mg/L	5.0	1.4	1		06/20/17 10:58		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	276	mg/L	10.0	5.0	1		06/14/17 14:48		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/15/17 16:27	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.2	mg/L	1.2	0.10	1		06/13/17 22:38	16887-00-6	
Nitrate as N	0.53	mg/L	0.10	0.013	1		06/13/17 22:38	14797-55-8	H3,M1
Sulfate	5.4	mg/L	1.2	0.16	1		06/13/17 22:38	14808-79-8	M1

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Sample: MW05D-GW-060917**      **Lab ID: 10391914001**      Collected: 06/09/17 09:35      Received: 06/13/17 08:10      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.59</b>	mg/L	0.020	0.0075	1		06/13/17 13:37		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:50		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.84J</b>	mg/L	1.0	0.20	1		06/16/17 16:14	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

**Sample: MW03D-GW-060917**      **Lab ID: 10391914002**      Collected: 06/09/17 12:18      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/14/17 08:36	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/14/17 08:36	74-85-1	
Methane	2.6J	ug/L	10.0	1.1	1		06/14/17 08:36	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:04	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:04	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:04	7440-38-2	
Barium, Dissolved	41.2	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:04	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:04	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:04	7440-43-9	
Calcium, Dissolved	30400	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:04	7440-70-2	
Chromium, Dissolved	5.0J	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:04	7440-47-3	
Cobalt, Dissolved	0.82J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:04	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:04	7440-50-8	
Iron, Dissolved	59.3	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:04	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:04	7439-92-1	
Magnesium, Dissolved	9030	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:04	7439-95-4	
Manganese, Dissolved	12.9	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:04	7439-96-5	
Nickel, Dissolved	4.1J	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:04	7440-02-0	
Potassium, Dissolved	1190J	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:04	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:04	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:04	7440-22-4	
Sodium, Dissolved	12800	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:04	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:04	7440-28-0	
Vanadium, Dissolved	1.6J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:04	7440-62-2	
Zinc, Dissolved	16.2J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:04	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/22/17 12:44	06/25/17 16:26	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	143	mg/L	5.0	1.4	1		06/20/17 11:42		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	194	mg/L	10.0	5.0	1		06/14/17 14:48		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/15/17 16:28	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.4	mg/L	1.2	0.10	1		06/13/17 23:40	16887-00-6	
Nitrate as N	0.14	mg/L	0.10	0.013	1		06/13/17 23:40	14797-55-8	H3
Sulfate	2.8	mg/L	1.2	0.16	1		06/13/17 23:40	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Sample: MW03D-GW-060917**      **Lab ID: 10391914002**      Collected: 06/09/17 12:18      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>0.17</b>	mg/L	0.020	0.0075	1		06/13/17 13:38		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:50		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.32J</b>	mg/L	1.0	0.20	1		06/16/17 16:27	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

**Sample:** MW14D-GW-060917      **Lab ID:** 10391914003      Collected: 06/09/17 14:34      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/14/17 08:43	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/14/17 08:43	74-85-1	
Methane	2.1J	ug/L	10.0	1.1	1		06/14/17 08:43	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	17.0J	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:14	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:14	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:14	7440-38-2	
Barium, Dissolved	28.4	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:14	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:14	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:14	7440-43-9	
Calcium, Dissolved	31100	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:14	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:14	7440-47-3	
Cobalt, Dissolved	1.4J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:14	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:14	7440-50-8	
Iron, Dissolved	128	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:14	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:14	7439-92-1	
Magnesium, Dissolved	9490	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:14	7439-95-4	
Manganese, Dissolved	431	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:14	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:14	7440-02-0	
Potassium, Dissolved	504J	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:14	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:14	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:14	7440-22-4	
Sodium, Dissolved	22500	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:14	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:14	7440-28-0	
Vanadium, Dissolved	5.2J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:14	7440-62-2	
Zinc, Dissolved	6.2J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:14	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/22/17 12:44	06/25/17 16:28	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	154	mg/L	5.0	1.4	1		06/20/17 11:46		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	242	mg/L	10.0	5.0	1		06/14/17 14:48		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0067J	mg/L	0.020	0.0050	1		06/15/17 16:29	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.1	mg/L	1.2	0.10	1		06/13/17 23:56	16887-00-6	
Nitrate as N	0.050J	mg/L	0.10	0.013	1		06/13/17 23:56	14797-55-8	H3
Sulfate	17.6	mg/L	1.2	0.16	1		06/13/17 23:56	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Sample: MW14D-GW-060917**      **Lab ID: 10391914003**      Collected: 06/09/17 14:34      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.035</b>	mg/L	0.020	0.0075	1		06/13/17 13:41		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:50		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.2</b>	mg/L	1.0	0.20	1		06/16/17 16:40	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

**Sample: MW04D-GW-060917**      **Lab ID: 10391914004**      Collected: 06/09/17 17:55      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/14/17 08:50	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/14/17 08:50	74-85-1	
Methane	1.9J	ug/L	10.0	1.1	1		06/14/17 08:50	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:17	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:17	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:17	7440-38-2	
Barium, Dissolved	48.5	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:17	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:17	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:17	7440-43-9	
Calcium, Dissolved	40100	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:17	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:17	7440-47-3	
Cobalt, Dissolved	0.85J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:17	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:17	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:17	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:17	7439-92-1	
Magnesium, Dissolved	13600	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:17	7439-95-4	
Manganese, Dissolved	6.6	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:17	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:17	7440-02-0	
Potassium, Dissolved	3090	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:17	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:17	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:17	7440-22-4	
Sodium, Dissolved	19200	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:17	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:17	7440-28-0	
Vanadium, Dissolved	10.4J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:17	7440-62-2	
Zinc, Dissolved	18.4J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:17	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/22/17 12:44	06/25/17 16:30	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	189	mg/L	5.0	1.4	1		06/20/17 11:51		M1
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	262	mg/L	10.0	5.0	1		06/14/17 14:48		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/15/17 16:30	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	6.4	mg/L	1.2	0.10	1		06/14/17 00:11	16887-00-6	
Nitrate as N	1.5	mg/L	0.10	0.013	1		06/14/17 00:11	14797-55-8	H3
Sulfate	16.7	mg/L	1.2	0.16	1		06/14/17 00:11	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391914

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**Sample: MW04D-GW-060917**      **Lab ID: 10391914004**      Collected: 06/09/17 17:55      Received: 06/13/17 08:10      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.6</b>	mg/L	0.020	0.0075	1		06/13/17 13:42		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/19/17 08:56	06/19/17 15:51		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.0</b>	mg/L	1.0	0.20	1		06/16/17 16:54	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 479515 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2611872 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/14/17 08:06	
Ethene	ug/L	<0.68	10.0	0.68	06/14/17 08:06	
Methane	ug/L	1.6J	10.0	1.1	06/14/17 08:06	

LABORATORY CONTROL SAMPLE & LCSD: 2611873

Parameter	Units	2611874								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	112	119	99	105	85-115	6	20	
Ethene	ug/L	106	106	112	99	105	85-115	6	20	
Methane	ug/L	60.7	59.6	63.2	98	104	85-115	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611875

Parameter	Units	2611876										
		10392001003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	88.2	82.0	78	72	30-150	7	20	
Ethene	ug/L	<0.68	106	106	83.8	77.9	79	73	30-150	7	20	
Methane	ug/L	3.4J	60.7	60.7	48.5	44.3	74	67	30-150	9	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 479748 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2613044 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/25/17 15:55	

LABORATORY CONTROL SAMPLE: 2613045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.4	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621880 2621881

Parameter	Units	10391954002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.20	5	5	4.4	4.3	87	87	80-120	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 480287 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2616280 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/20/17 12:22	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/20/17 12:22	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/20/17 12:22	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/20/17 12:22	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/20/17 12:22	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/20/17 12:22	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/20/17 12:22	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/20/17 12:22	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/20/17 12:22	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/20/17 12:22	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/20/17 12:22	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/20/17 12:22	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/20/17 12:22	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/20/17 12:22	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/20/17 12:22	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/20/17 12:22	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/20/17 12:22	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/20/17 12:22	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/20/17 12:22	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/20/17 12:22	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/20/17 12:22	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/20/17 12:22	

LABORATORY CONTROL SAMPLE: 2616281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	987	99	80-120	
Arsenic, Dissolved	ug/L	1000	988	99	80-120	
Barium, Dissolved	ug/L	1000	989	99	80-120	
Beryllium, Dissolved	ug/L	1000	997	100	80-120	
Cadmium, Dissolved	ug/L	1000	993	99	80-120	
Calcium, Dissolved	ug/L	20000	19400	97	80-120	
Chromium, Dissolved	ug/L	1000	981	98	80-120	
Cobalt, Dissolved	ug/L	1000	980	98	80-120	
Copper, Dissolved	ug/L	1000	969	97	80-120	
Iron, Dissolved	ug/L	20000	19600	98	80-120	
Lead, Dissolved	ug/L	1000	995	100	80-120	
Magnesium, Dissolved	ug/L	20000	19800	99	80-120	
Manganese, Dissolved	ug/L	1000	993	99	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

LABORATORY CONTROL SAMPLE: 2616281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	984	98	80-120	
Potassium, Dissolved	ug/L	20000	19500	97	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	495	99	80-120	
Sodium, Dissolved	ug/L	20000	19300	97	80-120	
Thallium, Dissolved	ug/L	1000	951	95	80-120	
Vanadium, Dissolved	ug/L	1000	966	97	80-120	
Zinc, Dissolved	ug/L	1000	996	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616282 2616283

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10392064010 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	ND	20000	20000	21600	21700	108	108	75-125	1	20	
Antimony, Dissolved	ug/L	ND	1000	1000	1030	1050	103	105	75-125	1	20	
Arsenic, Dissolved	ug/L	ND	1000	1000	1050	1060	105	105	75-125	1	20	
Barium, Dissolved	ug/L	206	1000	1000	1210	1210	100	101	75-125	1	20	
Beryllium, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20	
Cadmium, Dissolved	ug/L	ND	1000	1000	1030	1030	103	103	75-125	0	20	
Calcium, Dissolved	ug/L	165000	20000	20000	190000	189000	121	117	75-125	0	20	
Chromium, Dissolved	ug/L	ND	1000	1000	1010	1010	100	101	75-125	1	20	
Cobalt, Dissolved	ug/L	ND	1000	1000	988	994	98	99	75-125	1	20	
Copper, Dissolved	ug/L	ND	1000	1000	1030	1040	103	103	75-125	1	20	
Iron, Dissolved	ug/L	5950	20000	20000	26000	26000	100	100	75-125	0	20	
Lead, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	75-125	1	20	
Magnesium, Dissolved	ug/L	29900	20000	20000	51300	51300	107	107	75-125	0	20	
Manganese, Dissolved	ug/L	1700	1000	1000	2710	2710	101	101	75-125	0	20	
Nickel, Dissolved	ug/L	ND	1000	1000	980	986	98	99	75-125	1	20	
Potassium, Dissolved	ug/L	13600	20000	20000	35400	35500	109	109	75-125	0	20	
Selenium, Dissolved	ug/L	ND	1000	1000	1070	1070	107	107	75-125	0	20	
Silver, Dissolved	ug/L	ND	500	500	516	521	103	104	75-125	1	20	
Sodium, Dissolved	ug/L	69500	20000	20000	90500	90100	105	103	75-125	0	20	
Thallium, Dissolved	ug/L	ND	1000	1000	975	987	97	98	75-125	1	20	
Vanadium, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	75-125	1	20	
Zinc, Dissolved	ug/L	ND	1000	1000	980	984	98	98	75-125	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 480556 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2617519 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/20/17 09:32	

LABORATORY CONTROL SAMPLE & LCSD: 2617520 2617521

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	41.9	42.2	105	105	90-110	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2617522 2617523

Parameter	Units	10392089002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	83.7	40	40	126	125	105	104	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2617524 2617525

Parameter	Units	10391914004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	189	40	40	219	214	75	62	80-120	2	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 479533 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2611940 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/14/17 14:48	

LABORATORY CONTROL SAMPLE: 2611941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	934	93	80-120	

SAMPLE DUPLICATE: 2611942

Parameter	Units	10391578002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	969	974	1	10	

SAMPLE DUPLICATE: 2611943

Parameter	Units	10391967001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1800	1640	9	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 82719 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 352040 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/15/17 16:10	

LABORATORY CONTROL SAMPLE: 352041

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	103	90-110	

MATRIX SPIKE SAMPLE: 352043

Parameter	Units	2055854008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.16	79	75-125	

SAMPLE DUPLICATE: 352042

Parameter	Units	2055854008 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 479410 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2611187 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/13/17 21:59	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/13/17 21:59	
Sulfate	mg/L	<0.16	1.2	0.16	06/13/17 21:59	

LABORATORY CONTROL SAMPLE: 2611188

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Nitrate as N	mg/L	1	0.91	91	90-110	
Sulfate	mg/L	12.5	12.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611189 2611190

Parameter	Units	2611189		2611190		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10391914001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	2.2	12.5	12.5	13.9	94	93	90-110	1	20	
Nitrate as N	mg/L	0.53	1	1	1.4	88	87	90-110	1	20 M1	
Sulfate	mg/L	5.4	12.5	12.5	16.6	89	88	90-110	1	20 M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 479396 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2611129 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/13/17 13:44	

LABORATORY CONTROL SAMPLE: 2611130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611131 2611132

Parameter	Units	10391766001		2611131		2611132		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Nitrogen, NO2 plus NO3	mg/L	7.0	5	5	11.8	11.6	97	94	90-110	1	20 E

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2611133 2611134

Parameter	Units	10391766002		2611133		2611134		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Nitrogen, NO2 plus NO3	mg/L	1.8	1	1	2.7	2.7	93	94	90-110	0	20 E

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 480302 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 2616335 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/19/17 15:43	

LABORATORY CONTROL SAMPLE: 2616336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	288	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616337 2616338

Parameter	Units	10391445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	245	245	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616339 2616340

Parameter	Units	10391446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	237	231	95	92	90-110	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

QC Batch: 116641 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

METHOD BLANK: 460680 Matrix: Water  
Associated Lab Samples: 10391914001, 10391914002, 10391914003, 10391914004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/16/17 10:31	

LABORATORY CONTROL SAMPLE: 460681

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.3	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 460682 460683

Parameter	Units	1289470001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	9.0	25	25	34.9	35.0	104	104	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 460684 460685

Parameter	Units	10391769004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	12.7	25	25	37.9	37.6	101	100	80-120	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391914

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391914001	MW05D-GW-060917	RSK 175	479515		
10391914002	MW03D-GW-060917	RSK 175	479515		
10391914003	MW14D-GW-060917	RSK 175	479515		
10391914004	MW04D-GW-060917	RSK 175	479515		
10391914001	MW05D-GW-060917	EPA 3010	480287	6010C Met	480602
10391914002	MW03D-GW-060917	EPA 3010	480287	6010C Met	480602
10391914003	MW14D-GW-060917	EPA 3010	480287	6010C Met	480602
10391914004	MW04D-GW-060917	EPA 3010	480287	6010C Met	480602
10391914001	MW05D-GW-060917	EPA 7470A	479748	EPA 7470A	481496
10391914002	MW03D-GW-060917	EPA 7470A	479748	EPA 7470A	481496
10391914003	MW14D-GW-060917	EPA 7470A	479748	EPA 7470A	481496
10391914004	MW04D-GW-060917	EPA 7470A	479748	EPA 7470A	481496
10391914001	MW05D-GW-060917	SM 2320B	480556		
10391914002	MW03D-GW-060917	SM 2320B	480556		
10391914003	MW14D-GW-060917	SM 2320B	480556		
10391914004	MW04D-GW-060917	SM 2320B	480556		
10391914001	MW05D-GW-060917	SM 2540C	479533		
10391914002	MW03D-GW-060917	SM 2540C	479533		
10391914003	MW14D-GW-060917	SM 2540C	479533		
10391914004	MW04D-GW-060917	SM 2540C	479533		
10391914001	MW05D-GW-060917	SM 4500-S-2 D	82719		
10391914002	MW03D-GW-060917	SM 4500-S-2 D	82719		
10391914003	MW14D-GW-060917	SM 4500-S-2 D	82719		
10391914004	MW04D-GW-060917	SM 4500-S-2 D	82719		
10391914001	MW05D-GW-060917	EPA 300.0	479410		
10391914002	MW03D-GW-060917	EPA 300.0	479410		
10391914003	MW14D-GW-060917	EPA 300.0	479410		
10391914004	MW04D-GW-060917	EPA 300.0	479410		
10391914001	MW05D-GW-060917	EPA 353.2	479396		
10391914002	MW03D-GW-060917	EPA 353.2	479396		
10391914003	MW14D-GW-060917	EPA 353.2	479396		
10391914004	MW04D-GW-060917	EPA 353.2	479396		
10391914001	MW05D-GW-060917	EPA 410.4	480302	EPA 410.4	480347
10391914002	MW03D-GW-060917	EPA 410.4	480302	EPA 410.4	480347
10391914003	MW14D-GW-060917	EPA 410.4	480302	EPA 410.4	480347
10391914004	MW04D-GW-060917	EPA 410.4	480302	EPA 410.4	480347
10391914001	MW05D-GW-060917	SM 5310C	116641		
10391914002	MW03D-GW-060917	SM 5310C	116641		
10391914003	MW14D-GW-060917	SM 5310C	116641		
10391914004	MW04D-GW-060917	SM 5310C	116641		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10391914

Section A Required Client Information: Section B Required Project Information: Section C Invoice Information:

Page: \_\_\_\_\_ Of \_\_\_\_\_

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR
Email: mark.Ochsner@ch2n.com	Purchase Order #:	Address: CAS
Phone: _____ Fax _____	Project Name: UPRR_Freeman	Pace Quote:
Requested Due Date/Circle: 24 Hour / 5 Day / <b>10 Day</b>	Project #: 1497	Pace Project Manager:
		Pace Profile #: 36447 / 4

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , .)	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Y/N	Requested Analytes Filtered (Y/N)										State / Location WA / Freeman
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Na2S2O3	Methanol	Other	Analytes Test	Low Level VOCs by 8260		6010/7470 TAL Metals	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethane RSK175	BOD 10360W	COD 410.4	CSIA of CTET (8260 Must be analyzed)	
1	MW05D-GW-060917			WTG			4/17	0935	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	001				
2	MW03D-GW-060917			I	I			1218	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	002				
3	MW14D-GW-060917			I	I			1434	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	003				
4	MW04D-GW-060917			I	I			1755	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	004				
5	:																																
6																																	
7																																	
8																																	
9																																	
10																																	
11																																	
12																																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	LKB/CH2M			LH PAPE	6-13-17	810	1.8	Y	Y	Y
							1.9			

SAMPLER NAME AND SIGNATURE				TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: LK Baumann		SIGNATURE of SAMPLER: <i>LK Baumann</i>						

**Sample Condition Upon Receipt – ESI Tech Specs**

**Client Name:** CHAZM Hill      **Project #:** \_\_\_\_\_

WO#: 10391914

10391914

Optional:    Proj. Due Date:    Proj. Name: \_\_\_\_\_

**Courier:**     Fed Ex     UPS     USPS     Client  
 Commercial     Pace     SpeedDee     Other: \_\_\_\_\_

**Tracking Number:** 7222 2740 1367 / 1356

**Custody Seal on Cooler/Box Present?**     Yes     No      **Seals Intact?**     Yes     No

**Packing Material:**     Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**     Yes     No

**Thermometer Used:**     151401163     151401164      **Type of Ice:**     Wet     Blue     None     Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 1.7, 1.8      **Cooler Temp Corrected (°C):** 1.5, 1.9      **Biological Tissue Frozen?**     Yes     No     N/A  
Temp should be above freezing to 6°C      **Correction Factor:** TD-1      **Date and Initials of Person Examining Contents:** 6-13-17 AA

**USDA Regulated Soil** (  N/A, water sample)  
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?     Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?     Yes     No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5. <u>NITRATE/NITRITE OUT OF HOLD</u>
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>No MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. <u>6/13/17</u>
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	13. <input type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-4 11 11 11</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____      Lot # of added preservative: _____
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	15.

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**     Yes     No

Person Contacted: \_\_\_\_\_      Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1040</u>	Temp: <u>1.7, 1.8</u>	Corrected Temp: <u>1.5, 1.9</u>
Time: <u>1100</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS      **Date:** 06/13/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Chain of Custody

WO#: 2056099



Workorder: 10391914

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/13/2017

6/13/2017

Results requested By: 6/27/2017

Report To		Subcontract To					Requested Analysis												
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other													
1	MW05D-GW-060917	PS	6/9/2017 09:35	10391914001	Water	1						X							
2	MW03D-GW-060917	PS	6/9/2017 12:18	10391914002	Water	1						X							
3	MW14D-GW-060917	PS	6/9/2017 14:34	10391914003	Water	1						X							
4	MW04D-GW-060917	PS	6/9/2017 17:55	10391914004	Water	1						X							
5																			

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i> Pace MN	6/13/17 1430	<i>[Signature]</i> FedEx							
FedEx	6-14-17 850	<i>[Signature]</i> PACE	6-14-17 850						

Cooler Temperature on Receipt 1.9 °C Custody Seal  or N Received on Ice  or N Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

# WO#: 2056099

PM: CMM

Due Date: 06/23/17

CLIENT: PASI-MINN

Project: \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/14/17 CMM

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

**WO#: 1289401**

PM: HRZ Due Date: 06/27/17  
 CLIENT: PACE MPLS

Analytical  
 www.pacelabs.com

Page 4 of 44

Workorder: 10391914 Workorder Name: 1497 UPRR\_Freeman Owner Received Date: 6/13/2017 Results Requested By: 6/27/2017

Report To		Subcontract To					Requested Analysis																								
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					5632354 / 5310 TOC  LAB USE ONLY																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4																									
1	MW05D-GW-060917	PS	6/9/2017 09:35	10391914001	Water	3																									
2	MW03D-GW-060917	PS	6/9/2017 12:18	10391914002	Water	3																									
3	MW14D-GW-060917	PS	6/9/2017 14:34	10391914003	Water	3																									
4	MW04D-GW-060917	PS	6/9/2017 17:55	10391914004	Water	3																									
5																															
															Comments																
Transfers	Released By	Date/Time	Received By	Date/Time																											
1	<i>[Signature]</i> Pace MN	6/13/17 1430	<i>[Signature]</i>	6/13/17 1840																											
2	<i>[Signature]</i>	6/13/17 2150	<i>[Signature]</i>	6/14/17 0600																											
3																															
Cooler Temperature on Receipt 2.2 °C		Custody Seal <input checked="" type="checkbox"/> Y or N			Received on Ice <input checked="" type="checkbox"/> Y or N					Samples Intact <input checked="" type="checkbox"/> Y or N																					

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace - MIV Project #: \_\_\_\_\_

**WO#: 1289401**  
  
 1289401

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.9 Cooler Temp Corrected °C: 2.2 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: JLC 6/13/17

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>LOT</u>			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____			

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Heather Go Date: 6/14/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 26, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

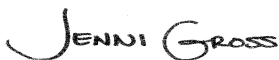
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10391927001	MW05D-GW-060917	Water	06/09/17 09:35	06/13/17 08:10
10391927002	MW03D-GW-060917	Water	06/09/17 12:18	06/13/17 08:10
10391927003	MW14D-GW-060917	Water	06/09/17 14:34	06/13/17 08:10
10391927004	MW04D-GW-060917	Water	06/09/17 17:55	06/13/17 08:10
10391927005	TB-060917	Water	06/09/17 07:00	06/13/17 08:10

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10391927001	MW05D-GW-060917	EPA 8260B	DJB	83	PASI-M
10391927002	MW03D-GW-060917	EPA 8260B	DJB	83	PASI-M
10391927003	MW14D-GW-060917	EPA 8260B	DJB	83	PASI-M
10391927004	MW04D-GW-060917	EPA 8260B	DJB	83	PASI-M
10391927005	TB-060917	EPA 8260B	PRD	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10391927001</b>	<b>MW05D-GW-060917</b>					
EPA 8260B	Acetone	8.8J	ug/L	20.0	06/22/17 03:36	
<b>10391927002</b>	<b>MW03D-GW-060917</b>					
EPA 8260B	Acetone	2.9J	ug/L	20.0	06/22/17 03:14	
<b>10391927003</b>	<b>MW14D-GW-060917</b>					
EPA 8260B	Chloromethane	0.54J	ug/L	4.0	06/22/17 02:52	
<b>10391927004</b>	<b>MW04D-GW-060917</b>					
EPA 8260B	Carbon tetrachloride	5.1	ug/L	0.50	06/22/17 02:31	
EPA 8260B	Chloroform	0.89J	ug/L	1.0	06/22/17 02:31	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

---

**Method:** EPA 8260B  
**Description:** 8260B MSV Low Level  
**Client:** UPRR\_CH2M Hill  
**Date:** June 26, 2017

### General Information:

5 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 480976

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- MS (Lab ID: 2622142)
  - Acetone
- MSD (Lab ID: 2622143)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 480843

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCSD (Lab ID: 2620252)
  - Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCSD (Lab ID: 2620252)
  - Tetrahydrofuran

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2620252)
  - Acetone
  - Tetrahydrofuran

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 26, 2017

QC Batch: 480976

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2619732)
  - Acetone
  - Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 480843

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392969001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2620250)
  - Acetone
  - Tetrahydrofuran

QC Batch: 480976

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393392001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2622142)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2622143)
  - Acetone
  - Tetrahydrofuran

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Sample: **MW05D-GW-060917** Lab ID: **10391927001** Collected: 06/09/17 09:35 Received: 06/13/17 08:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 03:36	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/22/17 03:36	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 03:36	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 03:36	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/22/17 03:36	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 03:36	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/22/17 03:36	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/22/17 03:36	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/22/17 03:36	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/22/17 03:36	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/22/17 03:36	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/22/17 03:36	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/22/17 03:36	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/22/17 03:36	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/22/17 03:36	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/22/17 03:36	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/22/17 03:36	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/22/17 03:36	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/22/17 03:36	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/22/17 03:36	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/22/17 03:36	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/22/17 03:36	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/22/17 03:36	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/22/17 03:36	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/22/17 03:36	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/22/17 03:36	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/22/17 03:36	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/22/17 03:36	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/22/17 03:36	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/22/17 03:36	108-10-1	
Acetone	8.8J	ug/L	20.0	0.64	1		06/22/17 03:36	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/22/17 03:36	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/22/17 03:36	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/22/17 03:36	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/22/17 03:36	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/22/17 03:36	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/22/17 03:36	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/22/17 03:36	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/22/17 03:36	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/22/17 03:36	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/22/17 03:36	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/22/17 03:36	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/22/17 03:36	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/22/17 03:36	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/22/17 03:36	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/22/17 03:36	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

**Sample: MW05D-GW-060917**      **Lab ID: 10391927001**      Collected: 06/09/17 09:35      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/22/17 03:36	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/22/17 03:36	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/22/17 03:36	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/22/17 03:36	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/22/17 03:36	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/22/17 03:36	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/22/17 03:36	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/22/17 03:36	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/22/17 03:36	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/22/17 03:36	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/22/17 03:36	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/22/17 03:36	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/22/17 03:36	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/22/17 03:36	109-99-9	L1
Toluene	<0.059	ug/L	0.50	0.059	1		06/22/17 03:36	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/22/17 03:36	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/22/17 03:36	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/22/17 03:36	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/22/17 03:36	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/22/17 03:36	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/22/17 03:36	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/22/17 03:36	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/22/17 03:36	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/22/17 03:36	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/22/17 03:36	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/22/17 03:36	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/22/17 03:36	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/22/17 03:36	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/22/17 03:36	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/22/17 03:36	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/22/17 03:36	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/22/17 03:36	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/22/17 03:36	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/22/17 03:36	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		06/22/17 03:36	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/22/17 03:36	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/22/17 03:36	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Sample: MW03D-GW-060917 Lab ID: 10391927002 Collected: 06/09/17 12:18 Received: 06/13/17 08:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 03:14	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/22/17 03:14	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 03:14	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 03:14	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/22/17 03:14	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 03:14	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/22/17 03:14	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/22/17 03:14	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/22/17 03:14	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/22/17 03:14	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/22/17 03:14	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/22/17 03:14	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/22/17 03:14	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/22/17 03:14	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/22/17 03:14	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/22/17 03:14	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/22/17 03:14	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/22/17 03:14	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/22/17 03:14	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/22/17 03:14	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/22/17 03:14	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/22/17 03:14	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/22/17 03:14	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/22/17 03:14	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/22/17 03:14	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/22/17 03:14	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/22/17 03:14	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/22/17 03:14	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/22/17 03:14	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/22/17 03:14	108-10-1	
Acetone	2.9J	ug/L	20.0	0.64	1		06/22/17 03:14	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/22/17 03:14	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/22/17 03:14	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/22/17 03:14	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/22/17 03:14	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/22/17 03:14	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/22/17 03:14	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/22/17 03:14	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/22/17 03:14	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/22/17 03:14	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/22/17 03:14	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/22/17 03:14	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/22/17 03:14	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/22/17 03:14	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/22/17 03:14	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/22/17 03:14	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

**Sample: MW03D-GW-060917**      **Lab ID: 10391927002**      Collected: 06/09/17 12:18      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/22/17 03:14	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/22/17 03:14	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/22/17 03:14	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/22/17 03:14	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/22/17 03:14	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/22/17 03:14	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/22/17 03:14	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/22/17 03:14	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/22/17 03:14	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/22/17 03:14	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/22/17 03:14	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/22/17 03:14	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/22/17 03:14	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/22/17 03:14	109-99-9	L1
Toluene	<0.059	ug/L	0.50	0.059	1		06/22/17 03:14	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/22/17 03:14	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/22/17 03:14	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/22/17 03:14	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/22/17 03:14	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/22/17 03:14	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/22/17 03:14	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/22/17 03:14	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/22/17 03:14	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/22/17 03:14	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/22/17 03:14	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/22/17 03:14	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/22/17 03:14	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/22/17 03:14	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/22/17 03:14	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/22/17 03:14	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/22/17 03:14	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/22/17 03:14	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/22/17 03:14	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/22/17 03:14	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		06/22/17 03:14	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/22/17 03:14	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		06/22/17 03:14	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Sample: MW14D-GW-060917 Lab ID: 10391927003 Collected: 06/09/17 14:34 Received: 06/13/17 08:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 02:52	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/22/17 02:52	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:52	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 02:52	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/22/17 02:52	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:52	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/22/17 02:52	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/22/17 02:52	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/22/17 02:52	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/22/17 02:52	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/22/17 02:52	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/22/17 02:52	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/22/17 02:52	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/22/17 02:52	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/22/17 02:52	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/22/17 02:52	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/22/17 02:52	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/22/17 02:52	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/22/17 02:52	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/22/17 02:52	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/22/17 02:52	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/22/17 02:52	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/22/17 02:52	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/22/17 02:52	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/22/17 02:52	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/22/17 02:52	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/22/17 02:52	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/22/17 02:52	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/22/17 02:52	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/22/17 02:52	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/22/17 02:52	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/22/17 02:52	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/22/17 02:52	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/22/17 02:52	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/22/17 02:52	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/22/17 02:52	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/22/17 02:52	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/22/17 02:52	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/22/17 02:52	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/22/17 02:52	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/22/17 02:52	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/22/17 02:52	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/22/17 02:52	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/22/17 02:52	67-66-3	
Chloromethane	0.54J	ug/L	4.0	0.080	1		06/22/17 02:52	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/22/17 02:52	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

**Sample: MW14D-GW-060917**      **Lab ID: 10391927003**      Collected: 06/09/17 14:34      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/22/17 02:52	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/22/17 02:52	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/22/17 02:52	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/22/17 02:52	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/22/17 02:52	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/22/17 02:52	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/22/17 02:52	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/22/17 02:52	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/22/17 02:52	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/22/17 02:52	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/22/17 02:52	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/22/17 02:52	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/22/17 02:52	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/22/17 02:52	109-99-9	L1
Toluene	<0.059	ug/L	0.50	0.059	1		06/22/17 02:52	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/22/17 02:52	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:52	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/22/17 02:52	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/22/17 02:52	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/22/17 02:52	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/22/17 02:52	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/22/17 02:52	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/22/17 02:52	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/22/17 02:52	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/22/17 02:52	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/22/17 02:52	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/22/17 02:52	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/22/17 02:52	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/22/17 02:52	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/22/17 02:52	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/22/17 02:52	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/22/17 02:52	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/22/17 02:52	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/22/17 02:52	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		06/22/17 02:52	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/22/17 02:52	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/22/17 02:52	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Sample: **MW04D-GW-060917** Lab ID: **10391927004** Collected: 06/09/17 17:55 Received: 06/13/17 08:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 02:31	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/22/17 02:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:31	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/22/17 02:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/22/17 02:31	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:31	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/22/17 02:31	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/22/17 02:31	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/22/17 02:31	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/22/17 02:31	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/22/17 02:31	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/22/17 02:31	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/22/17 02:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/22/17 02:31	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/22/17 02:31	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/22/17 02:31	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/22/17 02:31	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/22/17 02:31	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/22/17 02:31	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/22/17 02:31	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/22/17 02:31	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/22/17 02:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/22/17 02:31	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/22/17 02:31	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/22/17 02:31	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/22/17 02:31	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/22/17 02:31	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/22/17 02:31	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/22/17 02:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/22/17 02:31	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/22/17 02:31	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/22/17 02:31	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/22/17 02:31	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/22/17 02:31	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/22/17 02:31	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/22/17 02:31	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/22/17 02:31	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/22/17 02:31	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/22/17 02:31	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/22/17 02:31	75-15-0	
Carbon tetrachloride	5.1	ug/L	0.50	0.079	1		06/22/17 02:31	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/22/17 02:31	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/22/17 02:31	75-00-3	
Chloroform	0.89J	ug/L	1.0	0.21	1		06/22/17 02:31	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/22/17 02:31	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/22/17 02:31	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Sample: MW04D-GW-060917 Lab ID: 10391927004 Collected: 06/09/17 17:55 Received: 06/13/17 08:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/22/17 02:31	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/22/17 02:31	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/22/17 02:31	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/22/17 02:31	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/22/17 02:31	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/22/17 02:31	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/22/17 02:31	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/22/17 02:31	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/22/17 02:31	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/22/17 02:31	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/22/17 02:31	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/22/17 02:31	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/22/17 02:31	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/22/17 02:31	109-99-9	L1
Toluene	<0.059	ug/L	0.50	0.059	1		06/22/17 02:31	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/22/17 02:31	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/22/17 02:31	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/22/17 02:31	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/22/17 02:31	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/22/17 02:31	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/22/17 02:31	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/22/17 02:31	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/22/17 02:31	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/22/17 02:31	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/22/17 02:31	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/22/17 02:31	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/22/17 02:31	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/22/17 02:31	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/22/17 02:31	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/22/17 02:31	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/22/17 02:31	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/22/17 02:31	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/22/17 02:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/22/17 02:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		06/22/17 02:31	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/22/17 02:31	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/22/17 02:31	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

**Sample: TB-060917**      **Lab ID: 10391927005**      Collected: 06/09/17 07:00      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/21/17 20:42	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/21/17 20:42	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/21/17 20:42	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/21/17 20:42	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/21/17 20:42	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/21/17 20:42	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/21/17 20:42	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/21/17 20:42	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/21/17 20:42	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/21/17 20:42	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/21/17 20:42	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/21/17 20:42	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/21/17 20:42	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/21/17 20:42	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/21/17 20:42	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/21/17 20:42	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/21/17 20:42	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/21/17 20:42	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/21/17 20:42	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/21/17 20:42	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/21/17 20:42	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/21/17 20:42	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/21/17 20:42	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/21/17 20:42	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/21/17 20:42	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/21/17 20:42	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/21/17 20:42	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/21/17 20:42	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/21/17 20:42	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/21/17 20:42	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/21/17 20:42	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/21/17 20:42	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/21/17 20:42	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/21/17 20:42	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/21/17 20:42	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/21/17 20:42	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/21/17 20:42	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/21/17 20:42	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/21/17 20:42	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/21/17 20:42	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/21/17 20:42	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/21/17 20:42	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/21/17 20:42	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/21/17 20:42	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/21/17 20:42	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/21/17 20:42	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

**Sample: TB-060917**      **Lab ID: 10391927005**      Collected: 06/09/17 07:00      Received: 06/13/17 08:10      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/21/17 20:42	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/21/17 20:42	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/21/17 20:42	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/21/17 20:42	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/21/17 20:42	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/21/17 20:42	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/21/17 20:42	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/21/17 20:42	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/21/17 20:42	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/21/17 20:42	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/21/17 20:42	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/21/17 20:42	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/21/17 20:42	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/21/17 20:42	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/21/17 20:42	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/21/17 20:42	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/21/17 20:42	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/21/17 20:42	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/21/17 20:42	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/21/17 20:42	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/21/17 20:42	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/21/17 20:42	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/21/17 20:42	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/21/17 20:42	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/21/17 20:42	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/21/17 20:42	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/21/17 20:42	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/21/17 20:42	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/21/17 20:42	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/21/17 20:42	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/21/17 20:42	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/21/17 20:42	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/21/17 20:42	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/21/17 20:42	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		06/21/17 20:42	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		06/21/17 20:42	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		06/21/17 20:42	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

QC Batch: 480843 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391927005

METHOD BLANK: 2619000 Matrix: Water  
Associated Lab Samples: 10391927005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/21/17 12:20	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/21/17 12:20	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/21/17 12:20	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/21/17 12:20	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/21/17 12:20	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/21/17 12:20	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/21/17 12:20	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/21/17 12:20	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/21/17 12:20	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/21/17 12:20	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/21/17 12:20	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/21/17 12:20	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/21/17 12:20	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/21/17 12:20	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/21/17 12:20	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/21/17 12:20	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/21/17 12:20	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/21/17 12:20	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/21/17 12:20	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/21/17 12:20	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/21/17 12:20	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/21/17 12:20	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/21/17 12:20	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/21/17 12:20	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/21/17 12:20	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/21/17 12:20	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/21/17 12:20	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/21/17 12:20	
Acetone	ug/L	<0.64	20.0	0.64	06/21/17 12:20	
Acrolein	ug/L	<2.1	10.0	2.1	06/21/17 12:20	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/21/17 12:20	
Benzene	ug/L	<0.042	0.50	0.042	06/21/17 12:20	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/21/17 12:20	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/21/17 12:20	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/21/17 12:20	
Bromoform	ug/L	<0.11	4.0	0.11	06/21/17 12:20	
Bromomethane	ug/L	<0.20	4.0	0.20	06/21/17 12:20	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/21/17 12:20	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/21/17 12:20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

METHOD BLANK: 2619000

Matrix: Water

Associated Lab Samples: 10391927005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/21/17 12:20	
Chloroethane	ug/L	<0.12	1.0	0.12	06/21/17 12:20	
Chloroform	ug/L	<0.21	1.0	0.21	06/21/17 12:20	
Chloromethane	ug/L	<0.080	4.0	0.080	06/21/17 12:20	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/21/17 12:20	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/21/17 12:20	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/21/17 12:20	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/21/17 12:20	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/21/17 12:20	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/21/17 12:20	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/21/17 12:20	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/21/17 12:20	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/21/17 12:20	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/21/17 12:20	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/21/17 12:20	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/21/17 12:20	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/21/17 12:20	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/21/17 12:20	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/21/17 12:20	
Naphthalene	ug/L	<0.064	1.0	0.064	06/21/17 12:20	
o-Xylene	ug/L	<0.044	0.50	0.044	06/21/17 12:20	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/21/17 12:20	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/21/17 12:20	
Styrene	ug/L	<0.056	0.50	0.056	06/21/17 12:20	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/21/17 12:20	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/21/17 12:20	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/21/17 12:20	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/21/17 12:20	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/21/17 12:20	
Toluene	ug/L	<0.059	0.50	0.059	06/21/17 12:20	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/21/17 12:20	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/21/17 12:20	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/21/17 12:20	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/21/17 12:20	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/21/17 12:20	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/21/17 12:20	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/21/17 12:20	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/21/17 12:20	
1,2-Dichloroethane-d4 (S)	%	101	75-137		06/21/17 12:20	
4-Bromofluorobenzene (S)	%	100	75-125		06/21/17 12:20	
Toluene-d8 (S)	%	99	75-125		06/21/17 12:20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

LABORATORY CONTROL SAMPLE & LCSD: 2619001		2620252									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.1	19.2	101	96	75-136	5	30		
1,1,1-Trichloroethane	ug/L	20	19.2	17.5	96	88	75-129	9	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.5	20.8	102	104	71-138	2	30		
1,1,2-Trichloroethane	ug/L	20	20.8	21.1	104	106	75-125	2	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.5	15.4	88	77	69-126	13	30		
1,1-Dichloroethane	ug/L	20	18.6	17.2	93	86	75-125	8	30		
1,1-Dichloroethene	ug/L	20	18.3	16.6	92	83	75-125	10	30		
1,1-Dichloropropene	ug/L	20	17.7	16.2	88	81	75-125	9	30		
1,2,3-Trichlorobenzene	ug/L	20	20.0	20.0	100	100	75-125	0	30		
1,2,3-Trichloropropane	ug/L	20	21.1	21.0	105	105	75-125	1	30		
1,2,4-Trichlorobenzene	ug/L	20	20.3	19.5	102	97	75-125	4	30		
1,2,4-Trimethylbenzene	ug/L	20	19.2	18.6	96	93	75-125	3	30		
1,2-Dibromo-3-chloropropane	ug/L	50	49.7	52.0	99	104	71-130	5	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.8	20.8	104	104	75-125	0	30		
1,2-Dichlorobenzene	ug/L	20	19.1	19.1	95	96	75-125	0	30		
1,2-Dichloroethane	ug/L	20	18.8	18.1	94	91	70-125	4	30		
1,2-Dichloroethene (Total)	ug/L	40	35.9	33.5	90	84	75-125	7	30		
1,2-Dichloropropane	ug/L	20	19.0	18.3	95	91	75-125	4	30		
1,3,5-Trimethylbenzene	ug/L	20	18.9	18.1	94	91	75-125	4	30		
1,3-Dichlorobenzene	ug/L	20	19.8	19.8	99	99	75-125	0	30		
1,3-Dichloropropane	ug/L	20	20.1	19.5	101	97	75-125	3	30		
1,4-Dichlorobenzene	ug/L	20	18.7	18.8	94	94	75-125	0	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	379	405	95	101	64-140	7	30		
2,2,4-Trimethylpentane	ug/L	20	17.6	14.6	88	73	68-125	19	30		
2,2-Dichloropropane	ug/L	20	19.3	16.2	97	81	70-131	18	30		
2-Butanone (MEK)	ug/L	100	97.1	90.6	97	91	69-125	7	30		
2-Chlorotoluene	ug/L	20	18.5	18.1	93	90	75-125	3	30		
2-Hexanone	ug/L	100	104	104	104	104	73-129	0	30		
4-Chlorotoluene	ug/L	20	19.3	19.0	96	95	75-125	1	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	101	103	101	103	73-125	2	30		
Acetone	ug/L	100	113	163	113	163	66-126	36	30	L1,R1	
Acrolein	ug/L	200	197	252	98	126	56-150	24	30		
Acrylonitrile	ug/L	200	191	190	96	95	68-129	1	30		
Benzene	ug/L	20	17.9	16.8	90	84	75-125	7	30		
Bromobenzene	ug/L	20	19.4	20.3	97	101	75-125	4	30		
Bromochloromethane	ug/L	20	19.6	19.8	98	99	75-126	1	30		
Bromodichloromethane	ug/L	20	20.3	19.9	102	99	75-133	2	30		
Bromoform	ug/L	20	18.9	18.9	94	94	62-142	0	30		
Bromomethane	ug/L	20	16.1	16.0	80	80	34-143	1	30		
Carbon disulfide	ug/L	20	16.4	14.8	82	74	71-125	10	30		
Carbon tetrachloride	ug/L	20	18.7	17.0	94	85	71-145	10	30		
Chlorobenzene	ug/L	20	18.9	18.3	95	92	75-125	3	30		
Chloroethane	ug/L	20	20.3	18.6	102	93	75-125	9	30		
Chloroform	ug/L	20	18.2	18.0	91	90	75-125	1	30		
Chloromethane	ug/L	20	18.1	17.4	91	87	54-125	4	30		
cis-1,2-Dichloroethene	ug/L	20	18.1	17.5	91	88	75-125	3	30		
cis-1,3-Dichloropropene	ug/L	20	19.2	18.2	96	91	75-125	5	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

LABORATORY CONTROL SAMPLE & LCSD: 2619001		2620252								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.3	19.6	102	98	74-141	4	30	
Dibromomethane	ug/L	20	20.0	20.0	100	100	75-125	0	30	
Dichlorodifluoromethane	ug/L	20	18.1	16.4	90	82	59-130	10	30	
Dichlorofluoromethane	ug/L	20	19.5	17.6	97	88	75-125	10	30	
Diisopropyl ether	ug/L	20	18.2	17.7	91	89	69-125	3	30	
Ethyl-tert-butyl ether	ug/L	20	18.9	18.0	94	90	73-125	5	30	
Ethylbenzene	ug/L	20	18.2	17.6	91	88	75-125	4	30	
Hexachloro-1,3-butadiene	ug/L	20	21.2	19.7	106	98	75-131	7	30	
Isopropylbenzene (Cumene)	ug/L	20	18.8	18.6	94	93	75-125	1	30	
m&p-Xylene	ug/L	40	37.3	36.3	93	91	75-125	3	30	
Methyl-tert-butyl ether	ug/L	20	19.4	18.9	97	94	75-125	3	30	
Methylene Chloride	ug/L	20	18.1	17.7	91	89	73-125	2	30	
n-Butylbenzene	ug/L	20	20.4	18.8	102	94	75-125	9	30	
n-Propylbenzene	ug/L	20	18.8	17.9	94	90	75-125	5	30	
Naphthalene	ug/L	20	19.1	20.0	95	100	74-125	5	30	
o-Xylene	ug/L	20	18.9	18.8	94	94	75-125	0	30	
p-Isopropyltoluene	ug/L	20	19.8	18.6	99	93	75-125	6	30	
sec-Butylbenzene	ug/L	20	19.3	18.4	97	92	75-125	5	30	
Styrene	ug/L	20	19.4	19.4	97	97	75-125	0	30	
tert-Amylmethyl ether	ug/L	20	18.6	18.2	93	91	71-126	2	30	
tert-Butyl Alcohol	ug/L	200	206	214	103	107	69-131	4	30	
tert-Butylbenzene	ug/L	20	18.4	17.7	92	89	75-125	4	30	
Tetrachloroethene	ug/L	20	18.8	18.2	94	91	75-125	4	30	
Tetrahydrofuran	ug/L	200	179	306	90	153	65-127	52	30	L3,R1
Toluene	ug/L	20	18.7	18.1	93	90	75-125	4	30	
trans-1,2-Dichloroethene	ug/L	20	17.8	16.0	89	80	75-125	11	30	
trans-1,3-Dichloropropene	ug/L	20	19.7	18.9	99	95	75-125	4	30	
trans-1,4-Dichloro-2-butene	ug/L	50	49.0	47.7	98	95	30-150	3	30	
Trichloroethene	ug/L	20	18.4	17.6	92	88	75-125	4	30	
Trichlorofluoromethane	ug/L	20	18.4	16.6	92	83	71-140	10	30	
Vinyl acetate	ug/L	20	20.6	19.0	103	95	68-137	8	30	
Vinyl chloride	ug/L	20	19.6	17.9	98	89	70-125	10	30	
Xylene (Total)	ug/L	60	56.2	55.1	94	92	75-125	2	30	
1,2-Dichloroethane-d4 (S)	%				100	98	75-137			
4-Bromofluorobenzene (S)	%				100	100	75-125			
Toluene-d8 (S)	%				103	100	75-125			

MATRIX SPIKE SAMPLE: 2620250		10392969001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20.2	101	75-137	
1,1,1-Trichloroethane	ug/L	<0.057	20	20.6	103	75-139	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20.9	104	60-142	
1,1,2-Trichloroethane	ug/L	<0.064	20	21.0	105	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	22.7	113	62-150	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

MATRIX SPIKE SAMPLE:	2620250	10392969001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.055	20	19.3	96	70-129	
1,1-Dichloroethene	ug/L	<0.069	20	20.2	101	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	19.7	98	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	19.8	99	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	21.1	106	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	19.8	99	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	19.5	97	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50.1	100	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20.6	103	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	19.5	97	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	18.6	93	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.16	40	37.0	92	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	19.6	98	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	19.5	97	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	20.7	104	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	19.6	98	67-128	
1,4-Dichlorobenzene	ug/L	<0.081	20	19.2	96	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	407	102	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	19.8	99	48-150	
2,2-Dichloropropane	ug/L	<0.096	20	18.9	94	50-150	
2-Butanone (MEK)	ug/L	<1.1	100	89.8	90	58-125	
2-Chlorotoluene	ug/L	<0.084	20	19.4	97	65-138	
2-Hexanone	ug/L	<0.19	100	105	105	61-134	
4-Chlorotoluene	ug/L	<0.048	20	20.0	100	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	104	104	61-130	
Acetone	ug/L	10.8J	100	159	149	51-140	M1
Acrolein	ug/L	<2.1	200	277	138	48-150	
Acrylonitrile	ug/L	<0.49	200	193	96	55-134	
Benzene	ug/L	<0.042	20	18.3	92	63-132	
Bromobenzene	ug/L	<0.087	20	20.4	102	67-138	
Bromochloromethane	ug/L	<0.082	20	20.2	101	66-138	
Bromodichloromethane	ug/L	<0.068	20	20.8	104	75-137	
Bromoform	ug/L	<0.11	20	18.4	92	65-129	
Bromomethane	ug/L	<0.20	20	15.5	77	41-150	
Carbon disulfide	ug/L	<0.20	20	17.4	87	72-132	
Carbon tetrachloride	ug/L	<0.079	20	21.0	105	75-150	
Chlorobenzene	ug/L	<0.066	20	19.3	96	73-127	
Chloroethane	ug/L	<0.12	20	21.0	105	74-138	
Chloroform	ug/L	<0.21	20	19.5	97	74-125	
Chloromethane	ug/L	<0.080	20	19.0	95	58-129	
cis-1,2-Dichloroethene	ug/L	<0.12	20	18.4	92	63-135	
cis-1,3-Dichloropropene	ug/L	<0.069	20	18.3	91	66-129	
Dibromochloromethane	ug/L	<0.048	20	19.9	99	75-133	
Dibromomethane	ug/L	<0.14	20	20.2	101	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	25.1	125	72-150	
Dichlorofluoromethane	ug/L	<0.054	20	20.1	101	75-129	
Diisopropyl ether	ug/L	<0.050	20	18.4	92	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

MATRIX SPIKE SAMPLE: 2620250		10392969001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	18.6	93	63-132	
Ethylbenzene	ug/L	<0.075	20	19.1	95	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20.5	103	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20.2	101	70-136	
m&p-Xylene	ug/L	<0.11	40	39.0	98	64-142	
Methyl-tert-butyl ether	ug/L	0.12J	20	19.3	96	72-125	
Methylene Chloride	ug/L	<0.097	20	18.2	91	60-132	
n-Butylbenzene	ug/L	<0.16	20	20.8	104	60-150	
n-Propylbenzene	ug/L	<0.049	20	19.9	100	63-142	
Naphthalene	ug/L	<0.064	20	19.4	97	67-125	
o-Xylene	ug/L	<0.044	20	19.6	98	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	20.4	102	64-146	
sec-Butylbenzene	ug/L	<0.094	20	20.4	102	67-144	
Styrene	ug/L	<0.056	20	19.9	99	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	18.5	92	60-134	
tert-Butyl Alcohol	ug/L	15.6	200	264	124	56-146	
tert-Butylbenzene	ug/L	<0.051	20	19.3	96	68-135	
Tetrachloroethene	ug/L	<0.13	20	20.6	103	67-148	
Tetrahydrofuran	ug/L	<1.5	200	292	146	51-141 M1	
Toluene	ug/L	<0.059	20	19.6	98	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	18.6	93	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	18.8	94	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	47.6	95	30-150	
Trichloroethene	ug/L	<0.044	20	19.9	100	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	22.7	113	75-150	
Vinyl acetate	ug/L	<0.12	20	17.6	88	49-143	
Vinyl chloride	ug/L	<0.098	20	21.2	106	75-133	
Xylene (Total)	ug/L	<0.15	60	58.6	98	63-142	
1,2-Dichloroethane-d4 (S)	%				100	75-137	
4-Bromofluorobenzene (S)	%				99	75-125	
Toluene-d8 (S)	%				100	75-125	

SAMPLE DUPLICATE: 2620251

Parameter	Units	10392969002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

SAMPLE DUPLICATE: 2620251

Parameter	Units	10392969002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	<0.16	<0.16		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	<1.1	<1.1		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	24.6	30.5	21	30	L1
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	<0.20	<0.20		30	
Carbon tetrachloride	ug/L	<0.079	<0.079		30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	<0.21	<0.21		30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

SAMPLE DUPLICATE: 2620251

Parameter	Units	10392969002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	<0.064	<0.064		30	
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	<0.059	<0.059		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	105	104	1		
4-Bromofluorobenzene (S)	%	101	103	3		
Toluene-d8 (S)	%	99	98	0		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

QC Batch: 480976 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10391927001, 10391927002, 10391927003, 10391927004

METHOD BLANK: 2619731 Matrix: Water  
Associated Lab Samples: 10391927001, 10391927002, 10391927003, 10391927004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/22/17 00:41	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/22/17 00:41	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/22/17 00:41	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/22/17 00:41	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/22/17 00:41	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/22/17 00:41	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/22/17 00:41	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/22/17 00:41	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/22/17 00:41	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/22/17 00:41	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/22/17 00:41	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/22/17 00:41	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/22/17 00:41	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/22/17 00:41	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/22/17 00:41	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/22/17 00:41	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/22/17 00:41	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/22/17 00:41	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/22/17 00:41	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/22/17 00:41	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/22/17 00:41	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/22/17 00:41	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/22/17 00:41	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/22/17 00:41	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/22/17 00:41	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/22/17 00:41	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/22/17 00:41	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/22/17 00:41	
Acetone	ug/L	<0.64	20.0	0.64	06/22/17 00:41	
Acrolein	ug/L	<2.1	10.0	2.1	06/22/17 00:41	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/22/17 00:41	
Benzene	ug/L	<0.042	0.50	0.042	06/22/17 00:41	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/22/17 00:41	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/22/17 00:41	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/22/17 00:41	
Bromoform	ug/L	<0.11	4.0	0.11	06/22/17 00:41	
Bromomethane	ug/L	<0.20	4.0	0.20	06/22/17 00:41	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/22/17 00:41	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/22/17 00:41	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

METHOD BLANK: 2619731 Matrix: Water  
Associated Lab Samples: 10391927001, 10391927002, 10391927003, 10391927004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/22/17 00:41	
Chloroethane	ug/L	<0.12	1.0	0.12	06/22/17 00:41	
Chloroform	ug/L	<0.21	1.0	0.21	06/22/17 00:41	
Chloromethane	ug/L	<0.080	4.0	0.080	06/22/17 00:41	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/22/17 00:41	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/22/17 00:41	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/22/17 00:41	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/22/17 00:41	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/22/17 00:41	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/22/17 00:41	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/22/17 00:41	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/22/17 00:41	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/22/17 00:41	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/22/17 00:41	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/22/17 00:41	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/22/17 00:41	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/22/17 00:41	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/22/17 00:41	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/22/17 00:41	
Naphthalene	ug/L	<0.064	1.0	0.064	06/22/17 00:41	
o-Xylene	ug/L	<0.044	0.50	0.044	06/22/17 00:41	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/22/17 00:41	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/22/17 00:41	
Styrene	ug/L	<0.056	0.50	0.056	06/22/17 00:41	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/22/17 00:41	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/22/17 00:41	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/22/17 00:41	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/22/17 00:41	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/22/17 00:41	
Toluene	ug/L	<0.059	0.50	0.059	06/22/17 00:41	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/22/17 00:41	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/22/17 00:41	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/22/17 00:41	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/22/17 00:41	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/22/17 00:41	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/22/17 00:41	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/22/17 00:41	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/22/17 00:41	
1,2-Dichloroethane-d4 (S)	%	102	75-137		06/22/17 00:41	
4-Bromofluorobenzene (S)	%	100	75-125		06/22/17 00:41	
Toluene-d8 (S)	%	99	75-125		06/22/17 00:41	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

LABORATORY CONTROL SAMPLE: 2619732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.7	103	75-136	
1,1,1-Trichloroethane	ug/L	20	18.9	94	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	22.3	112	71-138	
1,1,2-Trichloroethane	ug/L	20	22.1	111	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.6	88	69-126	
1,1-Dichloroethane	ug/L	20	18.9	94	75-125	
1,1-Dichloroethene	ug/L	20	18.3	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.2	101	75-125	
1,2,3-Trichloropropane	ug/L	20	22.0	110	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.2	96	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.2	96	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	53.6	107	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	22.3	112	75-125	
1,2-Dichlorobenzene	ug/L	20	20.2	101	75-125	
1,2-Dichloroethane	ug/L	20	20.1	100	70-125	
1,2-Dichloroethene (Total)	ug/L	40	36.2	90	75-125	
1,2-Dichloropropane	ug/L	20	19.6	98	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.7	94	75-125	
1,3-Dichlorobenzene	ug/L	20	20.7	104	75-125	
1,3-Dichloropropane	ug/L	20	21.1	106	75-125	
1,4-Dichlorobenzene	ug/L	20	19.7	98	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	385	96	64-140	
2,2,4-Trimethylpentane	ug/L	20	14.8	74	68-125	
2,2-Dichloropropane	ug/L	20	17.4	87	70-131	
2-Butanone (MEK)	ug/L	100	99.8	100	69-125	
2-Chlorotoluene	ug/L	20	19.1	95	75-125	
2-Hexanone	ug/L	100	111	111	73-129	
4-Chlorotoluene	ug/L	20	19.6	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	73-125	
Acetone	ug/L	100	144	144	66-126	L1
Acrolein	ug/L	200	229	114	56-150	
Acrylonitrile	ug/L	200	210	105	68-129	
Benzene	ug/L	20	18.0	90	75-125	
Bromobenzene	ug/L	20	21.2	106	75-125	
Bromochloromethane	ug/L	20	20.3	101	75-126	
Bromodichloromethane	ug/L	20	21.3	107	75-133	
Bromoform	ug/L	20	19.4	97	62-142	
Bromomethane	ug/L	20	16.4	82	34-143	
Carbon disulfide	ug/L	20	15.7	78	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	19.0	95	75-125	
Chloroethane	ug/L	20	20.4	102	75-125	
Chloroform	ug/L	20	19.3	97	75-125	
Chloromethane	ug/L	20	18.1	91	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.4	92	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.0	100	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

LABORATORY CONTROL SAMPLE: 2619732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.1	106	74-141	
Dibromomethane	ug/L	20	22.0	110	75-125	
Dichlorodifluoromethane	ug/L	20	17.9	89	59-130	
Dichlorofluoromethane	ug/L	20	19.5	97	75-125	
Diisopropyl ether	ug/L	20	19.3	96	69-125	
Ethyl-tert-butyl ether	ug/L	20	19.8	99	73-125	
Ethylbenzene	ug/L	20	18.3	91	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.0	95	75-125	
m&p-Xylene	ug/L	40	38.0	95	75-125	
Methyl-tert-butyl ether	ug/L	20	21.0	105	75-125	
Methylene Chloride	ug/L	20	18.8	94	73-125	
n-Butylbenzene	ug/L	20	18.8	94	75-125	
n-Propylbenzene	ug/L	20	18.3	92	75-125	
Naphthalene	ug/L	20	20.0	100	74-125	
o-Xylene	ug/L	20	19.8	99	75-125	
p-Isopropyltoluene	ug/L	20	18.7	94	75-125	
sec-Butylbenzene	ug/L	20	18.0	90	75-125	
Styrene	ug/L	20	20.4	102	75-125	
tert-Amylmethyl ether	ug/L	20	20.0	100	71-126	
tert-Butyl Alcohol	ug/L	200	207	103	69-131	
tert-Butylbenzene	ug/L	20	18.1	90	75-125	
Tetrachloroethene	ug/L	20	18.4	92	75-125	
Tetrahydrofuran	ug/L	200	281	141	65-127 L1	
Toluene	ug/L	20	18.7	93	75-125	
trans-1,2-Dichloroethene	ug/L	20	17.7	89	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.9	100	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.1	98	30-150	
Trichloroethene	ug/L	20	18.8	94	75-125	
Trichlorofluoromethane	ug/L	20	17.9	90	71-140	
Vinyl acetate	ug/L	20	20.6	103	68-137	
Vinyl chloride	ug/L	20	19.1	96	70-125	
Xylene (Total)	ug/L	60	57.9	96	75-125	
1,2-Dichloroethane-d4 (S)	%			100	75-137	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			99	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2622142 2622143

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	21.2	21.1	106	106	75-137	0	30
1,1,1-Trichloroethane	ug/L	<0.057	20	20	21.5	21.7	108	108	75-139	1	30
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	21.8	21.1	109	106	60-142	3	30
1,1,2-Trichloroethane	ug/L	<0.064	20	20	21.9	22.2	109	111	75-128	1	30

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

Parameter	Units	2622142		2622143		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10393392001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	23.6	23.9	118	120	62-150	1	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	20.0	20.5	100	103	70-129	2	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	22.8	22.4	114	112	67-141	2	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	20.3	20.3	101	101	64-144	0	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	20.1	18.7	101	93	66-139	7	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	21.8	20.3	109	102	69-134	7	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	19.6	18.2	98	91	65-138	8	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	20.7	19.7	104	99	65-143	5	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	54.9	54.8	110	110	61-134	0	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	23.0	22.6	115	113	74-129	2	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	20.7	19.7	104	98	68-135	5	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	19.7	20.1	99	101	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.16	40	40	40.8	41.7	102	104	69-134	2	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	20.0	19.4	100	97	64-130	3	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	20.3	19.1	101	95	64-146	6	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	21.5	21.1	108	106	69-135	2	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	20.4	19.9	102	100	67-128	2	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	20.2	19.8	101	99	66-134	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	462	442	116	110	58-140	5	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	19.1	19.5	95	97	48-150	2	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	19.4	18.8	97	94	50-150	3	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	95.8	96.3	96	96	58-125	0	30		
2-Chlorotoluene	ug/L	<0.084	20	20	21.1	19.9	106	99	65-138	6	30		
2-Hexanone	ug/L	<0.19	100	100	110	110	110	110	61-134	0	30		
4-Chlorotoluene	ug/L	<0.048	20	20	21.5	20.1	108	100	68-135	7	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	109	108	109	108	61-130	1	30		
Acetone	ug/L	5.2J	100	100	173	168	168	162	51-140	3	30	CH <sub>3</sub> MO	
Acrolein	ug/L	<2.1	200	200	288	287	144	144	48-150	0	30		
Acrylonitrile	ug/L	<0.49	200	200	200	204	100	102	55-134	2	30		
Benzene	ug/L	<0.042	20	20	20.5	20.5	102	102	63-132	0	30		
Bromobenzene	ug/L	<0.087	20	20	21.7	21.3	109	107	67-138	2	30		
Bromochloromethane	ug/L	<0.082	20	20	21.0	21.1	105	106	66-138	0	30		
Bromodichloromethane	ug/L	<0.068	20	20	22.2	21.3	111	106	75-137	4	30		
Bromoform	ug/L	<0.11	20	20	17.6	17.9	88	90	65-129	2	30		
Bromomethane	ug/L	<0.20	20	20	20.9	22.0	105	110	41-150	5	30		
Carbon disulfide	ug/L	<0.20	20	20	22.1	21.8	111	109	72-132	2	30		
Carbon tetrachloride	ug/L	<0.079	20	20	22.2	21.5	111	108	75-150	3	30		
Chlorobenzene	ug/L	<0.066	20	20	20.9	20.4	104	102	73-127	2	30		
Chloroethane	ug/L	<0.12	20	20	22.8	23.3	114	116	74-138	2	30		
Chloroform	ug/L	<0.21	20	20	19.8	20.0	99	100	74-125	1	30		
Chloromethane	ug/L	<0.080	20	20	22.1	21.8	111	109	58-129	2	30		
cis-1,2-Dichloroethene	ug/L	<0.12	20	20	20.1	20.3	100	101	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.4	19.1	97	95	66-129	2	30		
Dibromochloromethane	ug/L	<0.048	20	20	21.7	21.6	109	108	75-133	0	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

Parameter	Units	2622142		2622143		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10393392001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<0.14	20	20	21.8	21.7	109	109	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	26.7	27.5	134	137	72-150	3	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	22.2	22.3	111	112	75-129	0	30		
Diisopropyl ether	ug/L	<0.050	20	20	20.9	21.3	105	107	62-128	2	30		
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	21.0	21.1	105	105	63-132	0	30		
Ethylbenzene	ug/L	<0.075	20	20	19.2	19.1	96	96	72-130	0	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	20.3	17.8	102	89	71-150	13	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	20.1	19.5	101	97	70-136	3	30		
m&p-Xylene	ug/L	<0.11	40	40	40.1	39.6	100	99	64-142	1	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	20.3	20.3	101	102	72-125	0	30		
Methylene Chloride	ug/L	<0.097	20	20	19.5	19.3	98	96	60-132	1	30		
n-Butylbenzene	ug/L	<0.16	20	20	20.6	19.3	103	97	60-150	7	30		
n-Propylbenzene	ug/L	<0.049	20	20	19.8	19.0	99	95	63-142	4	30		
Naphthalene	ug/L	<0.064	20	20	20.0	19.4	100	97	67-125	3	30		
o-Xylene	ug/L	<0.044	20	20	20.2	19.9	101	99	60-143	2	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	19.6	18.2	98	91	64-146	8	30		
sec-Butylbenzene	ug/L	<0.094	20	20	20.3	18.7	102	94	67-144	8	30		
Styrene	ug/L	<0.056	20	20	21.6	21.2	108	106	67-136	2	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	21.3	21.2	106	106	60-134	0	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	220	232	110	116	56-146	5	30		
tert-Butylbenzene	ug/L	<0.051	20	20	19.6	18.1	98	91	68-135	8	30		
Tetrachloroethene	ug/L	<0.13	20	20	22.4	21.9	112	109	67-148	2	30		
Tetrahydrofuran	ug/L	<1.5	200	200	316	310	158	155	51-141	2	30	MO	
Toluene	ug/L	<0.059	20	20	21.4	20.8	107	104	61-140	3	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	20.8	21.5	104	107	62-138	3	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	19.5	19.5	98	98	67-134	0	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	50.7	48.0	101	96	30-150	5	30		
Trichloroethene	ug/L	<0.044	20	20	21.3	20.6	107	103	64-149	3	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	24.3	24.1	122	121	75-150	1	30		
Vinyl acetate	ug/L	<0.12	20	20	20.0	19.7	100	99	49-143	1	30		
Vinyl chloride	ug/L	<0.098	20	20	23.7	23.9	119	120	75-133	1	30		
Xylene (Total)	ug/L	<0.15	60	60	60.3	59.5	101	99	63-142	1	30		
1,2-Dichloroethane-d4 (S)	%						98	100	75-137				
4-Bromofluorobenzene (S)	%						102	100	75-125				
Toluene-d8 (S)	%						99	101	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10391927

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.  
L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.  
R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10391927

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10391927001	MW05D-GW-060917	EPA 8260B	480976		
10391927002	MW03D-GW-060917	EPA 8260B	480976		
10391927003	MW14D-GW-060917	EPA 8260B	480976		
10391927004	MW04D-GW-060917	EPA 8260B	480976		
10391927005	TB-060917	EPA 8260B	480843		

### REPORT OF LABORATORY ANALYSIS

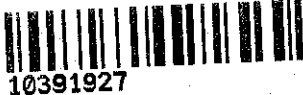
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**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M HILL **Project #:** \_\_\_\_\_

**WO# : 10391927**



10391927

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

**Tracking Number:** 7222 2740 1367

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No  
**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ **Temp Blank?**  Yes  No  
**Thermometer Used:**  151401163  151401164 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 1.7 **Cooler Temp Corrected (°C):** 1.8 **Biological Tissue Frozen?**  Yes  No  N/A  
 Temp should be above freezing to 6°C **Correction Factor:** -0.1 **Date and Initials of Person Examining Contents:** 6-13-17 [Signature]

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

			COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		8. <u>NO MS/MSD</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		Sample #
Exceptions: <input checked="" type="checkbox"/> VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Initial when completed: _____ Lot # of added preservative: _____
Per method, VOA pH is checked after analysis			
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		14. <u>2 vials from MW04D &amp; 1 trip blank vial</u>
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Field Data Required?  Yes  No

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1040</u>	Temp: <u>1.7</u>	Corrected Temp: <u>1.8</u>
Time: <u>1100</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: 06/13/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



June 29, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

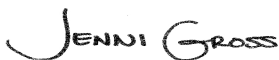
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification # : 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10392621001	WS5-Eff-GW-061417	Water	06/14/17 07:40	06/17/17 09:00
10392621002	WS5-Inf-GW-061417	Water	06/14/17 08:40	06/17/17 09:00
10392621003	MW17D-GW-061417	Water	06/14/17 12:30	06/17/17 09:00
10392621004	W20-GW-061417	Water	06/14/17 15:55	06/17/17 09:00
10392621005	MW06D-GW-061517	Water	06/15/17 08:05	06/17/17 09:00
10392621006	MW19D-GW-061517	Water	06/15/17 10:40	06/17/17 09:00
10392621007	W26-GW-061517	Water	06/15/17 13:20	06/17/17 09:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10392621001	WS5-Eff-GW-061417	EPA 410.4	DCL	1	PASI-M
10392621002	WS5-Inf-GW-061417	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10392621003	MW17D-GW-061417	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10392621004	W20-GW-061417	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10392621005	MW06D-GW-061517	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10392621006	MW19D-GW-061517	EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10392621007	W26-GW-061517	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10392621002</b>	<b>WS5-Inf-GW-061417</b>					
RSK 175	Methane	1.7J	ug/L	10.0	06/19/17 10:16	
6010C Met	Barium, Dissolved	51.6	ug/L	10.0	06/20/17 13:20	
6010C Met	Calcium, Dissolved	32600	ug/L	500	06/20/17 13:20	
6010C Met	Copper, Dissolved	1.8J	ug/L	10.0	06/20/17 13:20	
6010C Met	Magnesium, Dissolved	14500	ug/L	500	06/20/17 13:20	
6010C Met	Potassium, Dissolved	4880	ug/L	2500	06/20/17 13:20	
6010C Met	Sodium, Dissolved	14300	ug/L	1000	06/20/17 13:20	
6010C Met	Vanadium, Dissolved	19.8	ug/L	15.0	06/20/17 13:20	
6010C Met	Zinc, Dissolved	8.3J	ug/L	20.0	06/20/17 13:20	
SM 2320B	Alkalinity, Total as CaCO3	179	mg/L	5.0	06/23/17 12:44	M1
SM 2540C	Total Dissolved Solids	228	mg/L	10.0	06/21/17 14:13	
EPA 300.0	Chloride	2.6	mg/L	1.2	06/17/17 21:20	
EPA 300.0	Nitrate as N	1.0	mg/L	0.10	06/17/17 21:20	H3,M1
EPA 300.0	Sulfate	5.4	mg/L	1.2	06/17/17 21:20	
EPA 353.2	Nitrogen, NO2 plus NO3	1.2	mg/L	0.020	06/22/17 12:21	
SM 5310C	Total Organic Carbon	0.36J	mg/L	1.0	06/26/17 12:56	
<b>10392621003</b>	<b>MW17D-GW-061417</b>					
RSK 175	Ethene	2.2J	ug/L	10.0	06/20/17 10:01	
RSK 175	Methane	1.7J	ug/L	10.0	06/20/17 10:01	
6010C Met	Aluminum, Dissolved	94.9J	ug/L	200	06/20/17 13:23	
6010C Met	Barium, Dissolved	71.0	ug/L	10.0	06/20/17 13:23	
6010C Met	Calcium, Dissolved	43200	ug/L	500	06/20/17 13:23	
6010C Met	Chromium, Dissolved	3.2J	ug/L	10.0	06/20/17 13:23	
6010C Met	Cobalt, Dissolved	1.2J	ug/L	10.0	06/20/17 13:23	
6010C Met	Iron, Dissolved	99.9	ug/L	50.0	06/20/17 13:23	
6010C Met	Magnesium, Dissolved	18400	ug/L	500	06/20/17 13:23	
6010C Met	Manganese, Dissolved	236	ug/L	5.0	06/20/17 13:23	
6010C Met	Nickel, Dissolved	2.4J	ug/L	20.0	06/20/17 13:23	
6010C Met	Potassium, Dissolved	12800	ug/L	2500	06/20/17 13:23	
6010C Met	Sodium, Dissolved	56300	ug/L	1000	06/20/17 13:23	
6010C Met	Vanadium, Dissolved	2.1J	ug/L	15.0	06/20/17 13:23	
6010C Met	Zinc, Dissolved	6.9J	ug/L	20.0	06/20/17 13:23	
SM 2320B	Alkalinity, Total as CaCO3	186	mg/L	5.0	06/23/17 12:59	
SM 2540C	Total Dissolved Solids	446	mg/L	10.0	06/21/17 15:27	
SM 4500-S-2 D	Sulfide, Total	0.95	mg/L	0.020	06/21/17 09:39	
EPA 300.0	Chloride	28.4	mg/L	1.2	06/17/17 21:35	
EPA 300.0	Sulfate	98.1	mg/L	1.2	06/17/17 21:35	
EPA 410.4	Chemical Oxygen Demand	99.8	mg/L	50.0	06/22/17 13:47	
SM 5310C	Total Organic Carbon	20.7	mg/L	1.0	06/26/17 13:38	
<b>10392621004</b>	<b>W20-GW-061417</b>					
RSK 175	Methane	13.8	ug/L	10.0	06/20/17 10:15	
6010C Met	Barium, Dissolved	17.6	ug/L	10.0	06/20/17 13:25	
6010C Met	Calcium, Dissolved	39900	ug/L	500	06/20/17 13:25	
6010C Met	Iron, Dissolved	675	ug/L	50.0	06/20/17 13:25	
6010C Met	Magnesium, Dissolved	13600	ug/L	500	06/20/17 13:25	
6010C Met	Manganese, Dissolved	27.7	ug/L	5.0	06/20/17 13:25	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10392621004</b>	<b>W20-GW-061417</b>					
6010C Met	Potassium, Dissolved	2170J	ug/L	2500	06/20/17 13:25	
6010C Met	Sodium, Dissolved	10600	ug/L	1000	06/20/17 13:25	
6010C Met	Vanadium, Dissolved	8.0J	ug/L	15.0	06/20/17 13:25	
6010C Met	Zinc, Dissolved	4.7J	ug/L	20.0	06/20/17 13:25	
SM 2320B	Alkalinity, Total as CaCO3	154	mg/L	5.0	06/23/17 13:03	
SM 2540C	Total Dissolved Solids	245	mg/L	10.0	06/21/17 15:27	
SM 4500-S-2 D	Sulfide, Total	0.22	mg/L	0.020	06/21/17 09:42	
EPA 300.0	Chloride	2.2	mg/L	1.2	06/17/17 21:50	
EPA 300.0	Nitrate as N	4.4	mg/L	0.10	06/17/17 21:50	H3
EPA 300.0	Sulfate	11.9	mg/L	1.2	06/17/17 21:50	
EPA 353.2	Nitrogen, NO2 plus NO3	4.4	mg/L	0.10	06/22/17 12:34	
EPA 410.4	Chemical Oxygen Demand	34.6J	mg/L	50.0	06/22/17 13:47	
SM 5310C	Total Organic Carbon	0.73J	mg/L	1.0	06/26/17 13:52	
<b>10392621005</b>	<b>MW06D-GW-061517</b>					
RSK 175	Methane	2.2J	ug/L	10.0	06/20/17 12:31	
6010C Met	Barium, Dissolved	20.2	ug/L	10.0	06/20/17 13:28	
6010C Met	Calcium, Dissolved	33800	ug/L	500	06/20/17 13:28	
6010C Met	Cobalt, Dissolved	0.78J	ug/L	10.0	06/20/17 13:28	
6010C Met	Magnesium, Dissolved	15300	ug/L	500	06/20/17 13:28	
6010C Met	Manganese, Dissolved	26.1	ug/L	5.0	06/20/17 13:28	
6010C Met	Potassium, Dissolved	5990	ug/L	2500	06/20/17 13:28	
6010C Met	Sodium, Dissolved	17200	ug/L	1000	06/20/17 13:28	
6010C Met	Vanadium, Dissolved	16.9	ug/L	15.0	06/20/17 13:28	
6010C Met	Zinc, Dissolved	1.8J	ug/L	20.0	06/20/17 13:28	
SM 2320B	Alkalinity, Total as CaCO3	185	mg/L	5.0	06/24/17 11:13	
SM 2540C	Total Dissolved Solids	246	mg/L	10.0	06/21/17 15:27	
EPA 300.0	Chloride	3.9	mg/L	1.2	06/17/17 22:36	
EPA 300.0	Nitrate as N	0.69	mg/L	0.10	06/17/17 22:36	H3
EPA 300.0	Sulfate	5.0	mg/L	1.2	06/17/17 22:36	
EPA 353.2	Nitrogen, NO2 plus NO3	0.72	mg/L	0.020	06/29/17 11:33	M1
EPA 410.4	Chemical Oxygen Demand	64.3	mg/L	50.0	06/22/17 13:47	
SM 5310C	Total Organic Carbon	0.49J	mg/L	1.0	06/26/17 14:06	
<b>10392621006</b>	<b>MW19D-GW-061517</b>					
RSK 175	Methane	1.9J	ug/L	10.0	06/20/17 12:45	
6010C Met	Barium, Dissolved	17.1	ug/L	10.0	06/20/17 13:31	
6010C Met	Calcium, Dissolved	43900	ug/L	500	06/20/17 13:31	
6010C Met	Chromium, Dissolved	3.7J	ug/L	10.0	06/20/17 13:31	
6010C Met	Cobalt, Dissolved	0.79J	ug/L	10.0	06/20/17 13:31	
6010C Met	Copper, Dissolved	1.4J	ug/L	10.0	06/20/17 13:31	
6010C Met	Iron, Dissolved	42.8J	ug/L	50.0	06/20/17 13:31	
6010C Met	Magnesium, Dissolved	17200	ug/L	500	06/20/17 13:31	
6010C Met	Manganese, Dissolved	19.0	ug/L	5.0	06/20/17 13:31	
6010C Met	Nickel, Dissolved	3.7J	ug/L	20.0	06/20/17 13:31	
6010C Met	Potassium, Dissolved	3790	ug/L	2500	06/20/17 13:31	
6010C Met	Sodium, Dissolved	15500	ug/L	1000	06/20/17 13:31	
6010C Met	Thallium, Dissolved	4.7J	ug/L	20.0	06/20/17 13:31	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10392621006</b>	<b>MW19D-GW-061517</b>					
6010C Met	Vanadium, Dissolved	5.0J	ug/L	15.0	06/20/17 13:31	
6010C Met	Zinc, Dissolved	16.0J	ug/L	20.0	06/20/17 13:31	
SM 2320B	Alkalinity, Total as CaCO3	172	mg/L	5.0	06/24/17 11:17	
SM 2540C	Total Dissolved Solids	283	mg/L	10.0	06/21/17 15:27	
EPA 300.0	Chloride	7.7	mg/L	1.2	06/17/17 22:51	
EPA 300.0	Nitrate as N	4.3	mg/L	0.10	06/17/17 22:51	H1
EPA 300.0	Sulfate	21.8	mg/L	1.2	06/17/17 22:51	
EPA 353.2	Nitrogen, NO2 plus NO3	4.1	mg/L	0.10	06/29/17 12:54	M1
SM 5310C	Total Organic Carbon	0.88J	mg/L	1.0	06/26/17 14:21	
<b>10392621007</b>	<b>W26-GW-061517</b>					
RSK 175	Methane	1.4J	ug/L	10.0	06/20/17 12:53	
6010C Met	Barium, Dissolved	6.6J	ug/L	10.0	06/20/17 13:34	
6010C Met	Calcium, Dissolved	37700	ug/L	500	06/20/17 13:34	
6010C Met	Chromium, Dissolved	5.2J	ug/L	10.0	06/20/17 13:34	
6010C Met	Cobalt, Dissolved	0.72J	ug/L	10.0	06/20/17 13:34	
6010C Met	Iron, Dissolved	60.6	ug/L	50.0	06/20/17 13:34	
6010C Met	Magnesium, Dissolved	11000	ug/L	500	06/20/17 13:34	
6010C Met	Manganese, Dissolved	1.2J	ug/L	5.0	06/20/17 13:34	
6010C Met	Nickel, Dissolved	4.7J	ug/L	20.0	06/20/17 13:34	
6010C Met	Potassium, Dissolved	2190J	ug/L	2500	06/20/17 13:34	
6010C Met	Sodium, Dissolved	12500	ug/L	1000	06/20/17 13:34	
6010C Met	Thallium, Dissolved	4.4J	ug/L	20.0	06/20/17 13:34	
6010C Met	Vanadium, Dissolved	7.3J	ug/L	15.0	06/20/17 13:34	
6010C Met	Zinc, Dissolved	113	ug/L	20.0	06/20/17 13:34	
SM 2320B	Alkalinity, Total as CaCO3	140	mg/L	5.0	06/24/17 11:21	
SM 2540C	Total Dissolved Solids	239	mg/L	10.0	06/21/17 15:27	
EPA 300.0	Chloride	4.9	mg/L	1.2	06/17/17 23:06	
EPA 300.0	Nitrate as N	2.7	mg/L	0.10	06/17/17 23:06	H1
EPA 300.0	Sulfate	11.2	mg/L	1.2	06/17/17 23:06	
EPA 353.2	Nitrogen, NO2 plus NO3	2.6	mg/L	0.10	06/29/17 13:07	
SM 5310C	Total Organic Carbon	0.66J	mg/L	1.0	06/26/17 14:35	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481338

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392504001,10392621002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2621750)
- Alkalinity, Total as CaCO<sub>3</sub>

QC Batch: 481459

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392659004,10392784006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2622847)
- Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 83080

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392621002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 353820)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

### General Information:

6 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW19D-GW-061517 (Lab ID: 10392621006)
- W26-GW-061517 (Lab ID: 10392621007)

H3: Sample was received or analysis requested beyond the recognized method holding time.

- MW06D-GW-061517 (Lab ID: 10392621005)
- MW17D-GW-061417 (Lab ID: 10392621003)
- W20-GW-061417 (Lab ID: 10392621004)
- WS5-Inf-GW-061417 (Lab ID: 10392621002)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 480221

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392621002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2616184)
  - Nitrate as N
- MSD (Lab ID: 2616185)
  - Nitrate as N

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482461

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392621005,10392621006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2627861)
  - Nitrogen, NO2 plus NO3
- MS (Lab ID: 2627863)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2627864)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

Analyte Comments:

QC Batch: 481101

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2620350)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2620351)
  - Nitrogen, NO2 plus NO3

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

7 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 481028

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2620087)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2620088)
  - Chemical Oxygen Demand

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 29, 2017

**General Information:**

6 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 117520

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 464759)
  - Total Organic Carbon
- MSD (Lab ID: 464760)
  - Total Organic Carbon

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: WS5-Eff-GW-061417**      **Lab ID: 10392621001**      Collected: 06/14/17 07:40      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>410.4 COD</b>									
Analytical Method: EPA 410.4    Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:46		

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

**Sample: WS5-Inf-GW-061417**      **Lab ID: 10392621002**      Collected: 06/14/17 08:40      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/19/17 10:16	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/19/17 10:16	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		06/19/17 10:16	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:20	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:20	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:20	7440-38-2	
Barium, Dissolved	51.6	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:20	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:20	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:20	7440-43-9	
Calcium, Dissolved	32600	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:20	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:20	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:20	7440-48-4	
Copper, Dissolved	1.8J	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:20	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:20	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:20	7439-92-1	
Magnesium, Dissolved	14500	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:20	7439-95-4	
Manganese, Dissolved	<0.33	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:20	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:20	7440-02-0	
Potassium, Dissolved	4880	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:20	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:20	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:20	7440-22-4	
Sodium, Dissolved	14300	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:20	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:20	7440-28-0	
Vanadium, Dissolved	19.8	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:20	7440-62-2	
Zinc, Dissolved	8.3J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:20	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/20/17 07:25	06/20/17 14:06	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	179	mg/L	5.0	1.4	1		06/23/17 12:44		M1
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	228	mg/L	10.0	5.0	1		06/21/17 14:13		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/21/17 09:35	18496-25-8	M1
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.6	mg/L	1.2	0.10	1		06/17/17 21:20	16887-00-6	
Nitrate as N	1.0	mg/L	0.10	0.013	1		06/17/17 21:20	14797-55-8	H3,M1
Sulfate	5.4	mg/L	1.2	0.16	1		06/17/17 21:20	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: WS5-Inf-GW-061417**      **Lab ID: 10392621002**      Collected: 06/14/17 08:40      Received: 06/17/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.2</b>	mg/L	0.020	0.0075	1		06/22/17 12:21		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:46		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.36J</b>	mg/L	1.0	0.20	1		06/26/17 12:56	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

**Sample: MW17D-GW-061417**      **Lab ID: 10392621003**      Collected: 06/14/17 12:30      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/20/17 10:01	74-84-0	
Ethene	2.2J	ug/L	10.0	0.68	1		06/20/17 10:01	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		06/20/17 10:01	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	94.9J	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:23	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:23	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:23	7440-38-2	
Barium, Dissolved	71.0	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:23	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:23	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:23	7440-43-9	
Calcium, Dissolved	43200	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:23	7440-70-2	
Chromium, Dissolved	3.2J	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:23	7440-47-3	
Cobalt, Dissolved	1.2J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:23	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:23	7440-50-8	
Iron, Dissolved	99.9	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:23	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:23	7439-92-1	
Magnesium, Dissolved	18400	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:23	7439-95-4	
Manganese, Dissolved	236	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:23	7439-96-5	
Nickel, Dissolved	2.4J	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:23	7440-02-0	
Potassium, Dissolved	12800	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:23	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:23	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:23	7440-22-4	
Sodium, Dissolved	56300	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:23	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:23	7440-28-0	
Vanadium, Dissolved	2.1J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:23	7440-62-2	
Zinc, Dissolved	6.9J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:23	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/20/17 07:25	06/20/17 14:09	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	186	mg/L	5.0	1.4	1		06/23/17 12:59		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	446	mg/L	10.0	5.0	1		06/21/17 15:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.95	mg/L	0.020	0.0050	1		06/21/17 09:39	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	28.4	mg/L	1.2	0.10	1		06/17/17 21:35	16887-00-6	
Nitrate as N	<0.013	mg/L	0.10	0.013	1		06/17/17 21:35	14797-55-8	H3
Sulfate	98.1	mg/L	1.2	0.16	1		06/17/17 21:35	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: MW17D-GW-061417**      **Lab ID: 10392621003**      Collected: 06/14/17 12:30      Received: 06/17/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		06/22/17 12:22		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>99.8</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:47		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>20.7</b>	mg/L	1.0	0.20	1		06/26/17 13:38	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

**Sample: W20-GW-061417**      **Lab ID: 10392621004**      Collected: 06/14/17 15:55      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/20/17 10:15	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/20/17 10:15	74-85-1	
Methane	13.8	ug/L	10.0	1.1	1		06/20/17 10:15	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:25	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:25	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:25	7440-38-2	
Barium, Dissolved	17.6	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:25	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:25	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:25	7440-43-9	
Calcium, Dissolved	39900	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:25	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:25	7440-47-3	
Cobalt, Dissolved	<0.51	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:25	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:25	7440-50-8	
Iron, Dissolved	675	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:25	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:25	7439-92-1	
Magnesium, Dissolved	13600	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:25	7439-95-4	
Manganese, Dissolved	27.7	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:25	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:25	7440-02-0	
Potassium, Dissolved	2170J	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:25	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:25	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:25	7440-22-4	
Sodium, Dissolved	10600	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:25	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:25	7440-28-0	
Vanadium, Dissolved	8.0J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:25	7440-62-2	
Zinc, Dissolved	4.7J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:25	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/20/17 07:25	06/20/17 14:11	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	154	mg/L	5.0	1.4	1		06/23/17 13:03		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	245	mg/L	10.0	5.0	1		06/21/17 15:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.22	mg/L	0.020	0.0050	1		06/21/17 09:42	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.2	mg/L	1.2	0.10	1		06/17/17 21:50	16887-00-6	
Nitrate as N	4.4	mg/L	0.10	0.013	1		06/17/17 21:50	14797-55-8	H3
Sulfate	11.9	mg/L	1.2	0.16	1		06/17/17 21:50	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: W20-GW-061417**      **Lab ID: 10392621004**      Collected: 06/14/17 15:55      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.4</b>	mg/L	0.10	0.037	5		06/22/17 12:34		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>34.6J</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:47		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.73J</b>	mg/L	1.0	0.20	1		06/26/17 13:52	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

**Sample: MW06D-GW-061517**      **Lab ID: 10392621005**      Collected: 06/15/17 08:05      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/20/17 12:31	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/20/17 12:31	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		06/20/17 12:31	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:28	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:28	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:28	7440-38-2	
Barium, Dissolved	20.2	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:28	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:28	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:28	7440-43-9	
Calcium, Dissolved	33800	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:28	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:28	7440-47-3	
Cobalt, Dissolved	0.78J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:28	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:28	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:28	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:28	7439-92-1	
Magnesium, Dissolved	15300	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:28	7439-95-4	
Manganese, Dissolved	26.1	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:28	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:28	7440-02-0	
Potassium, Dissolved	5990	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:28	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:28	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:28	7440-22-4	
Sodium, Dissolved	17200	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:28	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:28	7440-28-0	
Vanadium, Dissolved	16.9	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:28	7440-62-2	
Zinc, Dissolved	1.8J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:28	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/20/17 07:25	06/20/17 14:13	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	185	mg/L	5.0	1.4	1		06/24/17 11:13		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	246	mg/L	10.0	5.0	1		06/21/17 15:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/21/17 09:43	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.9	mg/L	1.2	0.10	1		06/17/17 22:36	16887-00-6	
Nitrate as N	0.69	mg/L	0.10	0.013	1		06/17/17 22:36	14797-55-8	H3
Sulfate	5.0	mg/L	1.2	0.16	1		06/17/17 22:36	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: MW06D-GW-061517**      **Lab ID: 10392621005**      Collected: 06/15/17 08:05      Received: 06/17/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>0.72</b>	mg/L	0.020	0.0075	1		06/29/17 11:33		M1
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>64.3</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:47		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.49J</b>	mg/L	1.0	0.20	1		06/26/17 14:06	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

**Sample: MW19D-GW-061517**      **Lab ID: 10392621006**      Collected: 06/15/17 10:40      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/20/17 12:45	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/20/17 12:45	74-85-1	
Methane	1.9J	ug/L	10.0	1.1	1		06/20/17 12:45	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:31	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:31	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:31	7440-38-2	
Barium, Dissolved	17.1	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:31	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:31	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:31	7440-43-9	
Calcium, Dissolved	43900	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:31	7440-70-2	
Chromium, Dissolved	3.7J	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:31	7440-47-3	
Cobalt, Dissolved	0.79J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:31	7440-48-4	
Copper, Dissolved	1.4J	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:31	7440-50-8	
Iron, Dissolved	42.8J	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:31	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:31	7439-92-1	
Magnesium, Dissolved	17200	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:31	7439-95-4	
Manganese, Dissolved	19.0	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:31	7439-96-5	
Nickel, Dissolved	3.7J	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:31	7440-02-0	
Potassium, Dissolved	3790	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:31	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:31	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:31	7440-22-4	
Sodium, Dissolved	15500	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:31	7440-23-5	
Thallium, Dissolved	4.7J	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:31	7440-28-0	
Vanadium, Dissolved	5.0J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:31	7440-62-2	
Zinc, Dissolved	16.0J	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:31	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/20/17 07:25	06/20/17 14:16	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	172	mg/L	5.0	1.4	1		06/24/17 11:17		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	283	mg/L	10.0	5.0	1		06/21/17 15:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/21/17 09:44	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.7	mg/L	1.2	0.10	1		06/17/17 22:51	16887-00-6	
Nitrate as N	4.3	mg/L	0.10	0.013	1		06/17/17 22:51	14797-55-8	H1
Sulfate	21.8	mg/L	1.2	0.16	1		06/17/17 22:51	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: MW19D-GW-061517**      **Lab ID: 10392621006**      Collected: 06/15/17 10:40      Received: 06/17/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>4.1</b>	mg/L	0.10	0.037	5		06/29/17 12:54		M1
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:47		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.88J</b>	mg/L	1.0	0.20	1		06/26/17 14:21	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

**Sample: W26-GW-061517**      **Lab ID: 10392621007**      Collected: 06/15/17 13:20      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/20/17 12:53	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/20/17 12:53	74-85-1	
Methane	1.4J	ug/L	10.0	1.1	1		06/20/17 12:53	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/20/17 09:13	06/20/17 13:34	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:34	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/20/17 09:13	06/20/17 13:34	7440-38-2	
Barium, Dissolved	6.6J	ug/L	10.0	0.20	1	06/20/17 09:13	06/20/17 13:34	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/20/17 09:13	06/20/17 13:34	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/20/17 09:13	06/20/17 13:34	7440-43-9	
Calcium, Dissolved	37700	ug/L	500	15.8	1	06/20/17 09:13	06/20/17 13:34	7440-70-2	
Chromium, Dissolved	5.2J	ug/L	10.0	2.0	1	06/20/17 09:13	06/20/17 13:34	7440-47-3	
Cobalt, Dissolved	0.72J	ug/L	10.0	0.51	1	06/20/17 09:13	06/20/17 13:34	7440-48-4	
Copper, Dissolved	<0.89	ug/L	10.0	0.89	1	06/20/17 09:13	06/20/17 13:34	7440-50-8	
Iron, Dissolved	60.6	ug/L	50.0	18.0	1	06/20/17 09:13	06/20/17 13:34	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/20/17 09:13	06/20/17 13:34	7439-92-1	
Magnesium, Dissolved	11000	ug/L	500	7.4	1	06/20/17 09:13	06/20/17 13:34	7439-95-4	
Manganese, Dissolved	1.2J	ug/L	5.0	0.33	1	06/20/17 09:13	06/20/17 13:34	7439-96-5	
Nickel, Dissolved	4.7J	ug/L	20.0	1.6	1	06/20/17 09:13	06/20/17 13:34	7440-02-0	
Potassium, Dissolved	2190J	ug/L	2500	26.1	1	06/20/17 09:13	06/20/17 13:34	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/20/17 09:13	06/20/17 13:34	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/20/17 09:13	06/20/17 13:34	7440-22-4	
Sodium, Dissolved	12500	ug/L	1000	12.0	1	06/20/17 09:13	06/20/17 13:34	7440-23-5	
Thallium, Dissolved	4.4J	ug/L	20.0	3.8	1	06/20/17 09:13	06/20/17 13:34	7440-28-0	
Vanadium, Dissolved	7.3J	ug/L	15.0	0.39	1	06/20/17 09:13	06/20/17 13:34	7440-62-2	
Zinc, Dissolved	113	ug/L	20.0	1.4	1	06/20/17 09:13	06/20/17 13:34	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/20/17 07:25	06/20/17 14:18	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	140	mg/L	5.0	1.4	1		06/24/17 11:21		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	239	mg/L	10.0	5.0	1		06/21/17 15:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/21/17 09:45	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	4.9	mg/L	1.2	0.10	1		06/17/17 23:06	16887-00-6	
Nitrate as N	2.7	mg/L	0.10	0.013	1		06/17/17 23:06	14797-55-8	H1
Sulfate	11.2	mg/L	1.2	0.16	1		06/17/17 23:06	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

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**Sample: W26-GW-061517**      **Lab ID: 10392621007**      Collected: 06/15/17 13:20      Received: 06/17/17 09:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>2.6</b>	mg/L	0.10	0.037	5		06/29/17 13:07		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/22/17 08:07	06/22/17 13:48		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.66J</b>	mg/L	1.0	0.20	1		06/26/17 14:35	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 480223 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10392621002

METHOD BLANK: 2616190 Matrix: Water  
Associated Lab Samples: 10392621002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/19/17 07:45	
Ethene	ug/L	<0.68	10.0	0.68	06/19/17 07:45	
Methane	ug/L	1.6J	10.0	1.1	06/19/17 07:45	

LABORATORY CONTROL SAMPLE & LCSD: 2616191

Parameter	Units	2616192							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
Ethane	ug/L	114	121	127	107	112	85-115	5	20	
Ethene	ug/L	106	114	119	108	112	85-115	4	20	
Methane	ug/L	60.7	63.6	66.6	105	110	85-115	5	20	

SAMPLE DUPLICATE: 2616193

Parameter	Units	1289722012 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	11.0	10.6	4	20	
Ethene	ug/L	120	115	4	20	
Methane	ug/L	8200	7820	5	20	

SAMPLE DUPLICATE: 2616195

Parameter	Units	60246529003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	3.7J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 480224 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 2616196 Matrix: Water  
Associated Lab Samples: 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/20/17 09:44	
Ethene	ug/L	<0.68	10.0	0.68	06/20/17 09:44	
Methane	ug/L	1.5J	10.0	1.1	06/20/17 09:44	

LABORATORY CONTROL SAMPLE & LCSD: 2616197

Parameter	Units	2616198								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	128	125	113	110	85-115	3	20	
Ethene	ug/L	106	121	117	114	110	85-115	4	20	
Methane	ug/L	60.7	67.4	65.6	111	108	85-115	3	20	

SAMPLE DUPLICATE: 2616199

Parameter	Units	10392621003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	2.2J	2.8J		20	
Methane	ug/L	1.7J	2.1J		20	

SAMPLE DUPLICATE: 2617609

Parameter	Units	10392621005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	2.2J	1.6J		20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

QC Batch: 480344 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 2616505 Matrix: Water  
 Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/20/17 13:43	

LABORATORY CONTROL SAMPLE: 2616506

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616507 2616508

Parameter	Units	10392001003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.8	4.8	97	95	80-120	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 480287 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 2616280 Matrix: Water  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/20/17 12:22	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/20/17 12:22	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/20/17 12:22	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/20/17 12:22	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/20/17 12:22	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/20/17 12:22	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/20/17 12:22	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/20/17 12:22	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/20/17 12:22	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/20/17 12:22	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/20/17 12:22	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/20/17 12:22	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/20/17 12:22	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/20/17 12:22	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/20/17 12:22	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/20/17 12:22	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/20/17 12:22	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/20/17 12:22	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/20/17 12:22	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/20/17 12:22	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/20/17 12:22	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/20/17 12:22	

LABORATORY CONTROL SAMPLE: 2616281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	987	99	80-120	
Arsenic, Dissolved	ug/L	1000	988	99	80-120	
Barium, Dissolved	ug/L	1000	989	99	80-120	
Beryllium, Dissolved	ug/L	1000	997	100	80-120	
Cadmium, Dissolved	ug/L	1000	993	99	80-120	
Calcium, Dissolved	ug/L	20000	19400	97	80-120	
Chromium, Dissolved	ug/L	1000	981	98	80-120	
Cobalt, Dissolved	ug/L	1000	980	98	80-120	
Copper, Dissolved	ug/L	1000	969	97	80-120	
Iron, Dissolved	ug/L	20000	19600	98	80-120	
Lead, Dissolved	ug/L	1000	995	100	80-120	
Magnesium, Dissolved	ug/L	20000	19800	99	80-120	
Manganese, Dissolved	ug/L	1000	993	99	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

LABORATORY CONTROL SAMPLE: 2616281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	984	98	80-120	
Potassium, Dissolved	ug/L	20000	19500	97	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	495	99	80-120	
Sodium, Dissolved	ug/L	20000	19300	97	80-120	
Thallium, Dissolved	ug/L	1000	951	95	80-120	
Vanadium, Dissolved	ug/L	1000	966	97	80-120	
Zinc, Dissolved	ug/L	1000	996	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616282 2616283

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10392064010 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	ND	20000	20000	21600	21700	108	108	75-125	1	20	
Antimony, Dissolved	ug/L	ND	1000	1000	1030	1050	103	105	75-125	1	20	
Arsenic, Dissolved	ug/L	ND	1000	1000	1050	1060	105	105	75-125	1	20	
Barium, Dissolved	ug/L	206	1000	1000	1210	1210	100	101	75-125	1	20	
Beryllium, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20	
Cadmium, Dissolved	ug/L	ND	1000	1000	1030	1030	103	103	75-125	0	20	
Calcium, Dissolved	ug/L	165000	20000	20000	190000	189000	121	117	75-125	0	20	
Chromium, Dissolved	ug/L	ND	1000	1000	1010	1010	100	101	75-125	1	20	
Cobalt, Dissolved	ug/L	ND	1000	1000	988	994	98	99	75-125	1	20	
Copper, Dissolved	ug/L	ND	1000	1000	1030	1040	103	103	75-125	1	20	
Iron, Dissolved	ug/L	5950	20000	20000	26000	26000	100	100	75-125	0	20	
Lead, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	75-125	1	20	
Magnesium, Dissolved	ug/L	29900	20000	20000	51300	51300	107	107	75-125	0	20	
Manganese, Dissolved	ug/L	1700	1000	1000	2710	2710	101	101	75-125	0	20	
Nickel, Dissolved	ug/L	ND	1000	1000	980	986	98	99	75-125	1	20	
Potassium, Dissolved	ug/L	13600	20000	20000	35400	35500	109	109	75-125	0	20	
Selenium, Dissolved	ug/L	ND	1000	1000	1070	1070	107	107	75-125	0	20	
Silver, Dissolved	ug/L	ND	500	500	516	521	103	104	75-125	1	20	
Sodium, Dissolved	ug/L	69500	20000	20000	90500	90100	105	103	75-125	0	20	
Thallium, Dissolved	ug/L	ND	1000	1000	975	987	97	98	75-125	1	20	
Vanadium, Dissolved	ug/L	ND	1000	1000	1000	1010	100	101	75-125	1	20	
Zinc, Dissolved	ug/L	ND	1000	1000	980	984	98	98	75-125	0	20	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

QC Batch: 481338 Analysis Method: SM 2320B  
 QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
 Associated Lab Samples: 10392621002, 10392621003, 10392621004

METHOD BLANK: 2621745 Matrix: Water  
 Associated Lab Samples: 10392621002, 10392621003, 10392621004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/23/17 10:29	

LABORATORY CONTROL SAMPLE & LCSD: 2621746 2621747

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	42.2	43.4	105	108	90-110	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621748 2621749

Parameter	Units	10392504001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	337	40	40	379	379	107	106	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621750 2621751

Parameter	Units	10392621002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	179	40	40	209	211	74	80	80-120	1	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 481459 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10392621005, 10392621006, 10392621007

METHOD BLANK: 2622844 Matrix: Water  
Associated Lab Samples: 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/24/17 10:47	

LABORATORY CONTROL SAMPLE & LCSD: 2622845 2622846

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	42.2	42.3	106	106	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2622847 2622848

Parameter	Units	10392659004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	332	40	40	382	379	123	116	80-120	1	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2622849 2622850

Parameter	Units	10392784006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	95.8	40	40	138	137	105	103	80-120	1	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

QC Batch: 480892

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 2619245

Matrix: Water

Associated Lab Samples: 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/21/17 15:27	

LABORATORY CONTROL SAMPLE: 2619246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	956	96	80-120	

SAMPLE DUPLICATE: 2619247

Parameter	Units	10392621003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	446	446	0	10	

SAMPLE DUPLICATE: 2619248

Parameter	Units	10392621004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	245	251	2	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 83080 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 353817 Matrix: Water  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/21/17 09:34	

LABORATORY CONTROL SAMPLE: 353818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.20	101	90-110	

MATRIX SPIKE SAMPLE: 353820

Parameter	Units	10392621002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.11	53	75-125	M1

SAMPLE DUPLICATE: 353819

Parameter	Units	10392621002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 480221 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 2616182 Matrix: Water  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/17/17 23:36	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/17/17 23:36	
Sulfate	mg/L	<0.16	1.2	0.16	06/17/17 23:36	

LABORATORY CONTROL SAMPLE: 2616183

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.1	97	90-110	
Nitrate as N	mg/L	1	0.92	92	90-110	
Sulfate	mg/L	12.5	11.6	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2616184 2616185

Parameter	Units	10392621002		2616185		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	2.6	12.5	12.5	14.3	14.3	94	93	90-110	0	20
Nitrate as N	mg/L	1.0	1	1	1.8	1.8	85	85	90-110	0	20 M1
Sulfate	mg/L	5.4	12.5	12.5	16.6	16.6	90	90	90-110	0	20

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

QC Batch: 481101 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10392621002, 10392621003, 10392621004

METHOD BLANK: 2620348 Matrix: Water  
 Associated Lab Samples: 10392621002, 10392621003, 10392621004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/22/17 12:35	FS

LABORATORY CONTROL SAMPLE: 2620349

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2620350 2620351

Parameter	Units	2620350		2620351		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10392512002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Nitrogen, NO2 plus NO3	mg/L	2.0	1	1	2.9	3.0	94	103	90-110	3	20	E	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

QC Batch: 482461 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10392621005, 10392621006, 10392621007

METHOD BLANK: 2627859 Matrix: Water

Associated Lab Samples: 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/29/17 12:05	

LABORATORY CONTROL SAMPLE: 2627860

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.93	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627861 2627862

Parameter	Units	2627861		2627862		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10392621005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	0.72	1	1	1.6	1.6	89	93	90-110	2	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627863 2627864

Parameter	Units	2627863		2627864		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10392621006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	4.1	5	5	8.6	8.6	89	89	90-110	0	20 M1

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

QC Batch: 481028 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10392621001, 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 2620083 Matrix: Water  
 Associated Lab Samples: 10392621001, 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	06/22/17 13:43	

LABORATORY CONTROL SAMPLE: 2620084

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	301	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2620085 2620086

Parameter	Units	10392299001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	153000 ug/L	250	250	393	428	96	110	90-110	9	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2620087 2620088

Parameter	Units	10392314001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	1300	250	250	1550	1540	99	94	90-110	1	20 E	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

QC Batch: 117520 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

METHOD BLANK: 464755 Matrix: Water  
Associated Lab Samples: 10392621002, 10392621003, 10392621004, 10392621005, 10392621006, 10392621007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/26/17 12:27	

LABORATORY CONTROL SAMPLE: 464756

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 464757 464758

Parameter	Units	10392621002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	0.36J	25	25	25	26.5	27.0	105	107	80-120	2	20			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 464759 464760

Parameter	Units	10392659004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	32.8	25	25	25	57.8	57.7	100	99	80-120	0	20	E		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392621

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10392621002	WS5-Inf-GW-061417	RSK 175	480223		
10392621003	MW17D-GW-061417	RSK 175	480224		
10392621004	W20-GW-061417	RSK 175	480224		
10392621005	MW06D-GW-061517	RSK 175	480224		
10392621006	MW19D-GW-061517	RSK 175	480224		
10392621007	W26-GW-061517	RSK 175	480224		
10392621002	WS5-Inf-GW-061417	EPA 3010	480287	6010C Met	480602
10392621003	MW17D-GW-061417	EPA 3010	480287	6010C Met	480602
10392621004	W20-GW-061417	EPA 3010	480287	6010C Met	480602
10392621005	MW06D-GW-061517	EPA 3010	480287	6010C Met	480602
10392621006	MW19D-GW-061517	EPA 3010	480287	6010C Met	480602
10392621007	W26-GW-061517	EPA 3010	480287	6010C Met	480602
10392621002	WS5-Inf-GW-061417	EPA 7470A	480344	EPA 7470A	480645
10392621003	MW17D-GW-061417	EPA 7470A	480344	EPA 7470A	480645
10392621004	W20-GW-061417	EPA 7470A	480344	EPA 7470A	480645
10392621005	MW06D-GW-061517	EPA 7470A	480344	EPA 7470A	480645
10392621006	MW19D-GW-061517	EPA 7470A	480344	EPA 7470A	480645
10392621007	W26-GW-061517	EPA 7470A	480344	EPA 7470A	480645
10392621002	WS5-Inf-GW-061417	SM 2320B	481338		
10392621003	MW17D-GW-061417	SM 2320B	481338		
10392621004	W20-GW-061417	SM 2320B	481338		
10392621005	MW06D-GW-061517	SM 2320B	481459		
10392621006	MW19D-GW-061517	SM 2320B	481459		
10392621007	W26-GW-061517	SM 2320B	481459		
10392621002	WS5-Inf-GW-061417	SM 2540C	480775		
10392621003	MW17D-GW-061417	SM 2540C	480892		
10392621004	W20-GW-061417	SM 2540C	480892		
10392621005	MW06D-GW-061517	SM 2540C	480892		
10392621006	MW19D-GW-061517	SM 2540C	480892		
10392621007	W26-GW-061517	SM 2540C	480892		
10392621002	WS5-Inf-GW-061417	SM 4500-S-2 D	83080		
10392621003	MW17D-GW-061417	SM 4500-S-2 D	83080		
10392621004	W20-GW-061417	SM 4500-S-2 D	83080		
10392621005	MW06D-GW-061517	SM 4500-S-2 D	83080		
10392621006	MW19D-GW-061517	SM 4500-S-2 D	83080		
10392621007	W26-GW-061517	SM 4500-S-2 D	83080		
10392621002	WS5-Inf-GW-061417	EPA 300.0	480221		
10392621003	MW17D-GW-061417	EPA 300.0	480221		
10392621004	W20-GW-061417	EPA 300.0	480221		
10392621005	MW06D-GW-061517	EPA 300.0	480221		
10392621006	MW19D-GW-061517	EPA 300.0	480221		
10392621007	W26-GW-061517	EPA 300.0	480221		
10392621002	WS5-Inf-GW-061417	EPA 353.2	481101		
10392621003	MW17D-GW-061417	EPA 353.2	481101		

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392621

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10392621004	W20-GW-061417	EPA 353.2	481101		
10392621005	MW06D-GW-061517	EPA 353.2	482461		
10392621006	MW19D-GW-061517	EPA 353.2	482461		
10392621007	W26-GW-061517	EPA 353.2	482461		
10392621001	WS5-Eff-GW-061417	EPA 410.4	481028	EPA 410.4	481193
10392621002	WS5-Inf-GW-061417	EPA 410.4	481028	EPA 410.4	481193
10392621003	MW17D-GW-061417	EPA 410.4	481028	EPA 410.4	481193
10392621004	W20-GW-061417	EPA 410.4	481028	EPA 410.4	481193
10392621005	MW06D-GW-061517	EPA 410.4	481028	EPA 410.4	481193
10392621006	MW19D-GW-061517	EPA 410.4	481028	EPA 410.4	481193
10392621007	W26-GW-061517	EPA 410.4	481028	EPA 410.4	481193
10392621002	WS5-Inf-GW-061417	SM 5310C	117520		
10392621003	MW17D-GW-061417	SM 5310C	117520		
10392621004	W20-GW-061417	SM 5310C	117520		
10392621005	MW06D-GW-061517	SM 5310C	117520		
10392621006	MW19D-GW-061517	SM 5310C	117520		
10392621007	W26-GW-061517	SM 5310C	117520		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10392621

**Section A**

**Section B**

**Section C**

Page: 1 of 1

Required Client Information:

Required Project Information:

Invoice Information:

<b>Company:</b> CH2M Hill	<b>Report To:</b> Mark Ochsner, Brad Ostapkowicz	<b>Attention:</b> Anne Theriault
<b>Address:</b> 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	<b>Copy To:</b> Steve Demus, Lindsey Baumann	<b>Company:</b> UPRR
<b>Email:</b>	<b>Copy To:</b> David Hodson, UPRR-Sysdat@ghd.com	<b>Address:</b> 1400 W. 52nd Ave, Denver, CO 80221
<b>Phone:</b>	<b>Purchase Order #</b> PEDD# 1497	<b>Pace Quote:</b> Contract# 758938
<b>Requested Due Date:</b> <b>10 Day Standard</b>	<b>Project Name:</b> UPRR Freeman	<b>Pace Project Manager:</b> Jennifer Gross
	<b>Project #:</b> 1497	<b>Pace Profile #:</b> 36447 / 4

<b>Regulatory Agency</b>
<b>State / Location</b>
<b>WA / Freeman</b>

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					Y/N	Requested Analysis Filtered (Y/N)												
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate		Other	Analyses Test	Y										
						DATE	TIME	DATE	TIME												Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethane RSK175	COD 410.4	BOD 10360WLL
1	WS5-Eff-GW-061417	WT	G			6/14/17	0740			1		X													001					
2	WS5-Inf-GW-061417						0840			10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	002				
3	MW17D-GW-061417						1230			10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	003				
4	W20-GW-061417						1555			10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	004				
5	MW06D-GW-061517					6/15/17	0805			10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	005				
6	MW19D-GW-061517						1040			10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	006				
7	W26-GW-061517						1320			10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	007				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in <b>bold</b>	LKB/CH2M	6-16-17	0942	<i>[Signature]</i> Pace	6/17/17	9:00	2.7
*Field filtered by client							3.2 <i>[initials]</i> y y
							3.7 <i>[initials]</i>
							RG 6/16/17


SAMPLER NAME AND SIGNATURE				TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: L. Bouman								
SIGNATURE of SAMPLER: <i>[Signature]</i>				DATE Signed: 6-16-17				

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: **CH2M Hill**

Project #:

**WO#: 10392621**



10392621

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other:

Tracking Number:

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Temp Blank?  Yes  No  
 Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **2.63.6** Cooler Temp Corrected (°C): **2.73.7** Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: **70.1** Date and Initials of Person Examining Contents: **RLG/17/17**

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	Yes	No	N/A	COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		5. <i>Nitrates arrived out of hold</i>
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		6. <i>RLG/17/17</i>
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		8.
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9.
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>				
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res Chlorine? <input checked="" type="checkbox"/> Y
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Sample # <b>1-7 1/1</b> <b>2-7 1/1</b>
Exceptions: VOA/Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Initial when completed: <b>2-7 1/1</b> Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	14. <i>RSK need head space</i>
3 Trip Blanks Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):				

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: Steve and Lindsey Date/Time: 06/16/17

Field Data Required?  Yes  No

Comments/Resolution: Proceed with analysis on 300.0 nitrate past hold.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>12:22</b>	Temp: <b>2.63.6</b>	Corrected Temp: <b>2.73.7</b>
Time: <b>12:39</b>	put in cooler	
Time:	Temp:	Corrected Temp:

**Project Manager Review:**

JENNI GROSS Date: 06/19/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

Project #

# WO#: 2056449

PM: CMM

Due Date: 07/05/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/20/17 JS

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Chain of Custody

# WO#: 1289837

PM: HRZ

Due Date: 07/03/17

CLIENT: PACE MPLS

Page 64 of 55

Workorder: 10392621

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/17/2017

Results Requested By: 7/3/2017

<b>Report To</b> Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426	<b>Subcontract To</b> Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042	<b>Requested Analysis</b>
---	--	---------------------------

5632354 / 5310 TOC

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										LAB USE ONLY							
						H2SO4																	
1	WS5-Inf-GW-061417	PS	6/14/2017 08:40	10392621002	Water	3																	001
2	MW17D-GW-061417	PS	6/14/2017 12:30	10392621003	Water	3																	002
3	W20-GW-061417	PS	6/14/2017 15:55	10392621004	Water	3																	003
4	MW06D-GW-061517	PS	6/15/2017 08:05	10392621005	Water	3																	004
5	MW19D-GW-061517	PS	6/15/2017 10:40	10392621006	Water	3																	005
6	W26-GW-061517	PS	6/15/2017 13:20	10392621007	Water	3																	006

						Comments																	
Transfers	Released By		Date/Time	Received By	Date/Time																		
1	<i>Anna Asp</i>	Pace MN	6/19/17 1400	<i>[Signature]</i>	6/19/17 1910																		
2	<i>[Signature]</i>		6/14/17 2235	<i>[Signature]</i>	6/20/17 0800																		
3																							

Cooler Temperature on Receipt 31 °C    
 Custody Seal Y or N    
 Received on Ice Y or N    
 Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace-MIV

Project #: WO# : 1289837

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

PM: HRZ Due Date: 07/03/17  
 CLIENT: PACE MPLS

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Hot Pack Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.8 Cooler Temp Corrected °C: 3.1 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: JDK 6/14/17

Comments: MT Co-2017

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature]

Date: 6-20-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 20, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

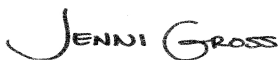
RE: Project: 661508 1497 UPRR\_Freeman  
Pace Project No.: 10392622

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10392622001	Trip Blank	Water	06/15/17 12:05	06/17/17 09:00
10392622002	MW2OU-GW-depth-061517	Water	06/15/17 12:20	06/17/17 09:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10392622001	Trip Blank	EPA 8260B	DJB	83	PASI-M
10392622002	MW2OU-GW-depth-061517	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10392622001</b>	<b>Trip Blank</b>					
EPA 8260B	Acetone	7.2J	ug/L	20.0	06/19/17 22:03	
EPA 8260B	Methylene Chloride	0.33J	ug/L	4.0	06/19/17 22:03	
<b>10392622002</b>	<b>MW2OU-GW-depth-061517</b>					
EPA 8260B	2-Hexanone	1.1J	ug/L	5.0	06/20/17 02:24	
EPA 8260B	Acetone	7.7J	ug/L	20.0	06/20/17 02:24	
EPA 8260B	Carbon tetrachloride	29.4	ug/L	0.50	06/20/17 02:24	
EPA 8260B	Chloroform	1.0	ug/L	1.0	06/20/17 02:24	
EPA 8260B	Tetrahydrofuran	3.1J	ug/L	10.0	06/20/17 02:24	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 20, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 480481

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392001003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2617135)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2617136)
  - Acetone
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

**Sample: Trip Blank**      **Lab ID: 10392622001**      Collected: 06/15/17 12:05      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/19/17 22:03	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/19/17 22:03	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/19/17 22:03	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/19/17 22:03	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/19/17 22:03	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/19/17 22:03	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/19/17 22:03	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/19/17 22:03	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/19/17 22:03	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/19/17 22:03	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/19/17 22:03	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/19/17 22:03	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/19/17 22:03	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/19/17 22:03	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/19/17 22:03	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/19/17 22:03	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/19/17 22:03	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/19/17 22:03	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/19/17 22:03	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/19/17 22:03	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/19/17 22:03	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/19/17 22:03	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/19/17 22:03	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/19/17 22:03	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/19/17 22:03	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/19/17 22:03	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/19/17 22:03	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/19/17 22:03	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/19/17 22:03	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/19/17 22:03	108-10-1	
Acetone	7.2J	ug/L	20.0	0.64	1		06/19/17 22:03	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/19/17 22:03	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/19/17 22:03	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/19/17 22:03	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/19/17 22:03	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/19/17 22:03	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/19/17 22:03	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/19/17 22:03	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/19/17 22:03	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/19/17 22:03	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/19/17 22:03	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/19/17 22:03	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/19/17 22:03	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/19/17 22:03	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/19/17 22:03	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/19/17 22:03	124-48-1	

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### ANALYTICAL RESULTS

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

**Sample: Trip Blank**      **Lab ID: 10392622001**      Collected: 06/15/17 12:05      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/19/17 22:03	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/19/17 22:03	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/19/17 22:03	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/19/17 22:03	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/19/17 22:03	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/19/17 22:03	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/19/17 22:03	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/19/17 22:03	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/19/17 22:03	1634-04-4	
Methylene Chloride	0.33J	ug/L	4.0	0.097	1		06/19/17 22:03	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/19/17 22:03	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/19/17 22:03	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/19/17 22:03	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/19/17 22:03	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/19/17 22:03	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/19/17 22:03	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/19/17 22:03	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/19/17 22:03	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/19/17 22:03	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/19/17 22:03	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/19/17 22:03	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/19/17 22:03	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/19/17 22:03	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/19/17 22:03	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/19/17 22:03	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/19/17 22:03	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/19/17 22:03	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/19/17 22:03	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/19/17 22:03	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/19/17 22:03	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/19/17 22:03	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/19/17 22:03	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/19/17 22:03	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/19/17 22:03	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		1		06/19/17 22:03	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		06/19/17 22:03	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		06/19/17 22:03	460-00-4	

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## ANALYTICAL RESULTS

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Sample: MW2OU-GW-depth-061517 Lab ID: 10392622002 Collected: 06/15/17 12:20 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/20/17 02:24	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/20/17 02:24	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/20/17 02:24	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/20/17 02:24	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/20/17 02:24	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/20/17 02:24	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/20/17 02:24	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/20/17 02:24	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/20/17 02:24	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/20/17 02:24	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/20/17 02:24	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/20/17 02:24	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/20/17 02:24	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/20/17 02:24	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/20/17 02:24	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/20/17 02:24	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/20/17 02:24	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/20/17 02:24	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/20/17 02:24	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/20/17 02:24	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/20/17 02:24	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/20/17 02:24	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/20/17 02:24	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/20/17 02:24	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/20/17 02:24	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/20/17 02:24	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/20/17 02:24	95-49-8	
2-Hexanone	1.1J	ug/L	5.0	0.19	1		06/20/17 02:24	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/20/17 02:24	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/20/17 02:24	108-10-1	
Acetone	7.7J	ug/L	20.0	0.64	1		06/20/17 02:24	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/20/17 02:24	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/20/17 02:24	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/20/17 02:24	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/20/17 02:24	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/20/17 02:24	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/20/17 02:24	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/20/17 02:24	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/20/17 02:24	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/20/17 02:24	75-15-0	
Carbon tetrachloride	29.4	ug/L	0.50	0.079	1		06/20/17 02:24	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/20/17 02:24	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/20/17 02:24	75-00-3	
Chloroform	1.0	ug/L	1.0	0.21	1		06/20/17 02:24	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/20/17 02:24	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/20/17 02:24	124-48-1	

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## ANALYTICAL RESULTS

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Sample: MW2OU-GW-depth-061517 Lab ID: 10392622002 Collected: 06/15/17 12:20 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/20/17 02:24	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/20/17 02:24	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/20/17 02:24	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/20/17 02:24	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/20/17 02:24	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/20/17 02:24	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/20/17 02:24	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/20/17 02:24	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/20/17 02:24	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/20/17 02:24	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/20/17 02:24	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/20/17 02:24	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/20/17 02:24	127-18-4	
Tetrahydrofuran	3.1J	ug/L	10.0	1.5	1		06/20/17 02:24	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/20/17 02:24	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/20/17 02:24	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/20/17 02:24	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/20/17 02:24	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/20/17 02:24	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/20/17 02:24	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/20/17 02:24	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/20/17 02:24	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/20/17 02:24	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/20/17 02:24	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/20/17 02:24	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/20/17 02:24	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/20/17 02:24	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/20/17 02:24	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/20/17 02:24	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/20/17 02:24	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/20/17 02:24	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/20/17 02:24	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/20/17 02:24	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/20/17 02:24	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		06/20/17 02:24	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		06/20/17 02:24	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		06/20/17 02:24	460-00-4	

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### QUALITY CONTROL DATA

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

QC Batch: 480481 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10392622001, 10392622002

METHOD BLANK: 2617133 Matrix: Water

Associated Lab Samples: 10392622001, 10392622002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/19/17 21:20	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/19/17 21:20	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/19/17 21:20	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/19/17 21:20	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/19/17 21:20	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/19/17 21:20	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/19/17 21:20	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/19/17 21:20	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/19/17 21:20	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/19/17 21:20	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/19/17 21:20	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/19/17 21:20	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/19/17 21:20	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/19/17 21:20	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/19/17 21:20	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/19/17 21:20	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/19/17 21:20	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/19/17 21:20	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/19/17 21:20	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/19/17 21:20	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/19/17 21:20	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/19/17 21:20	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/19/17 21:20	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/19/17 21:20	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/19/17 21:20	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/19/17 21:20	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/19/17 21:20	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/19/17 21:20	
Acetone	ug/L	<0.64	20.0	0.64	06/19/17 21:20	
Acrolein	ug/L	<2.1	10.0	2.1	06/19/17 21:20	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/19/17 21:20	
Benzene	ug/L	<0.042	0.50	0.042	06/19/17 21:20	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/19/17 21:20	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/19/17 21:20	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/19/17 21:20	
Bromoform	ug/L	<0.11	4.0	0.11	06/19/17 21:20	
Bromomethane	ug/L	<0.20	4.0	0.20	06/19/17 21:20	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/19/17 21:20	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/19/17 21:20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

METHOD BLANK: 2617133

Matrix: Water

Associated Lab Samples: 10392622001, 10392622002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/19/17 21:20	
Chloroethane	ug/L	<0.12	1.0	0.12	06/19/17 21:20	
Chloroform	ug/L	<0.21	1.0	0.21	06/19/17 21:20	
Chloromethane	ug/L	<0.080	4.0	0.080	06/19/17 21:20	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/19/17 21:20	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/19/17 21:20	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/19/17 21:20	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/19/17 21:20	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/19/17 21:20	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/19/17 21:20	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/19/17 21:20	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/19/17 21:20	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/19/17 21:20	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/19/17 21:20	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/19/17 21:20	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/19/17 21:20	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/19/17 21:20	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/19/17 21:20	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/19/17 21:20	
Naphthalene	ug/L	<0.064	1.0	0.064	06/19/17 21:20	
o-Xylene	ug/L	<0.044	0.50	0.044	06/19/17 21:20	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/19/17 21:20	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/19/17 21:20	
Styrene	ug/L	<0.056	0.50	0.056	06/19/17 21:20	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/19/17 21:20	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/19/17 21:20	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/19/17 21:20	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/19/17 21:20	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/19/17 21:20	
Toluene	ug/L	<0.059	0.50	0.059	06/19/17 21:20	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/19/17 21:20	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/19/17 21:20	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/19/17 21:20	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/19/17 21:20	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/19/17 21:20	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/19/17 21:20	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/19/17 21:20	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/19/17 21:20	
1,2-Dichloroethane-d4 (S)	%	99	75-137		06/19/17 21:20	
4-Bromofluorobenzene (S)	%	101	75-125		06/19/17 21:20	
Toluene-d8 (S)	%	101	75-125		06/19/17 21:20	

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### QUALITY CONTROL DATA

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

LABORATORY CONTROL SAMPLE: 2617134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.9	105	75-136	
1,1,1-Trichloroethane	ug/L	20	20.7	104	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.5	103	71-138	
1,1,2-Trichloroethane	ug/L	20	21.3	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.5	107	69-126	
1,1-Dichloroethane	ug/L	20	19.9	100	75-125	
1,1-Dichloroethene	ug/L	20	21.6	108	75-125	
1,1-Dichloropropene	ug/L	20	20.1	101	75-125	
1,2,3-Trichlorobenzene	ug/L	20	21.9	109	75-125	
1,2,3-Trichloropropane	ug/L	20	20.7	103	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.5	107	75-125	
1,2,4-Trimethylbenzene	ug/L	20	20.8	104	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	54.2	108	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	22.5	112	75-125	
1,2-Dichlorobenzene	ug/L	20	21.0	105	75-125	
1,2-Dichloroethane	ug/L	20	19.9	100	70-125	
1,2-Dichloroethene (Total)	ug/L	40	41.7	104	75-125	
1,2-Dichloropropane	ug/L	20	19.2	96	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.9	105	75-125	
1,3-Dichlorobenzene	ug/L	20	21.8	109	75-125	
1,3-Dichloropropane	ug/L	20	20.1	101	75-125	
1,4-Dichlorobenzene	ug/L	20	20.5	102	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	421	105	64-140	
2,2,4-Trimethylpentane	ug/L	20	21.7	108	68-125	
2,2-Dichloropropane	ug/L	20	19.7	99	70-131	
2-Butanone (MEK)	ug/L	100	93.2	93	69-125	
2-Chlorotoluene	ug/L	20	20.4	102	75-125	
2-Hexanone	ug/L	100	102	102	73-129	
4-Chlorotoluene	ug/L	20	21.2	106	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	101	101	73-125	
Acetone	ug/L	100	107	107	66-126	
Acrolein	ug/L	200	227	114	56-150	
Acrylonitrile	ug/L	200	202	101	68-129	
Benzene	ug/L	20	20.6	103	75-125	
Bromobenzene	ug/L	20	21.7	108	75-125	
Bromochloromethane	ug/L	20	21.8	109	75-126	
Bromodichloromethane	ug/L	20	21.5	108	75-133	
Bromoform	ug/L	20	18.3	92	62-142	
Bromomethane	ug/L	20	21.6	108	34-143	
Carbon disulfide	ug/L	20	21.3	107	71-125	
Carbon tetrachloride	ug/L	20	21.8	109	71-145	
Chlorobenzene	ug/L	20	20.6	103	75-125	
Chloroethane	ug/L	20	21.8	109	75-125	
Chloroform	ug/L	20	19.8	99	75-125	
Chloromethane	ug/L	20	20.5	102	54-125	
cis-1,2-Dichloroethene	ug/L	20	20.3	101	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	

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### QUALITY CONTROL DATA

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

LABORATORY CONTROL SAMPLE: 2617134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.8	109	74-141	
Dibromomethane	ug/L	20	21.2	106	75-125	
Dichlorodifluoromethane	ug/L	20	22.8	114	59-130	
Dichlorofluoromethane	ug/L	20	21.1	106	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	21.6	108	73-125	
Ethylbenzene	ug/L	20	19.2	96	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.8	109	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.4	102	75-125	
m&p-Xylene	ug/L	40	39.8	99	75-125	
Methyl-tert-butyl ether	ug/L	20	20.3	101	75-125	
Methylene Chloride	ug/L	20	19.1	96	73-125	
n-Butylbenzene	ug/L	20	21.7	108	75-125	
n-Propylbenzene	ug/L	20	19.8	99	75-125	
Naphthalene	ug/L	20	20.5	102	74-125	
o-Xylene	ug/L	20	20.2	101	75-125	
p-Isopropyltoluene	ug/L	20	20.0	100	75-125	
sec-Butylbenzene	ug/L	20	20.4	102	75-125	
Styrene	ug/L	20	21.6	108	75-125	
tert-Amylmethyl ether	ug/L	20	22.0	110	71-126	
tert-Butyl Alcohol	ug/L	200	216	108	69-131	
tert-Butylbenzene	ug/L	20	19.9	99	75-125	
Tetrachloroethene	ug/L	20	21.6	108	75-125	
Tetrahydrofuran	ug/L	200	215	107	65-127	
Toluene	ug/L	20	20.7	104	75-125	
trans-1,2-Dichloroethene	ug/L	20	21.4	107	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.9	99	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	50.6	101	30-150	
Trichloroethene	ug/L	20	20.8	104	75-125	
Trichlorofluoromethane	ug/L	20	21.7	109	71-140	
Vinyl acetate	ug/L	20	22.9	115	68-137	
Vinyl chloride	ug/L	20	22.2	111	70-125	
Xylene (Total)	ug/L	60	60.0	100	75-125	
1,2-Dichloroethane-d4 (S)	%			99	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2617135 2617136

Parameter	Units	2617135		2617136		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10392001003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	20	19.1	20.6	96	103	75-137	7	30	
1,1,1-Trichloroethane	ug/L	<0.057	20	20	19.8	21.5	99	107	75-139	8	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20	19.6	21.1	98	106	60-142	8	30	
1,1,2-Trichloroethane	ug/L	<0.064	20	20	19.7	21.4	98	107	75-128	9	30	

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### QUALITY CONTROL DATA

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Parameter	Units	10392001003		2617135		2617136		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	20	22.3	23.4	111	117	62-150	5	30		
1,1-Dichloroethane	ug/L	<0.055	20	20	19.6	20.7	98	104	70-129	6	30		
1,1-Dichloroethene	ug/L	<0.069	20	20	21.2	22.3	106	112	67-141	5	30		
1,1-Dichloropropene	ug/L	<0.082	20	20	20.2	21.8	101	109	64-144	7	30		
1,2,3-Trichlorobenzene	ug/L	<0.17	20	20	20.0	21.3	100	106	66-139	6	30		
1,2,3-Trichloropropane	ug/L	<0.19	20	20	19.3	20.4	97	102	69-134	6	30		
1,2,4-Trichlorobenzene	ug/L	<0.14	20	20	19.9	20.6	99	103	65-138	3	30		
1,2,4-Trimethylbenzene	ug/L	<0.068	20	20	18.9	20.6	95	103	65-143	9	30		
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	50	48.2	52.2	96	104	61-134	8	30		
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20	20.0	21.5	100	107	74-129	7	30		
1,2-Dichlorobenzene	ug/L	<0.078	20	20	18.7	20.1	94	101	68-135	7	30		
1,2-Dichloroethane	ug/L	<0.072	20	20	18.2	19.2	91	96	73-125	5	30		
1,2-Dichloroethene (Total)	ug/L	0.21J	40	40	38.6	40.9	96	102	69-134	6	30		
1,2-Dichloropropane	ug/L	<0.066	20	20	18.6	19.9	93	99	64-130	7	30		
1,3,5-Trimethylbenzene	ug/L	<0.042	20	20	19.0	20.6	95	103	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.085	20	20	19.4	21.5	97	107	69-135	10	30		
1,3-Dichloropropane	ug/L	<0.059	20	20	19.4	19.9	97	100	67-128	2	30		
1,4-Dichlorobenzene	ug/L	<0.081	20	20	18.6	20.0	93	100	66-134	7	30		
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	400	343	378	86	95	58-140	10	30		
2,2,4-Trimethylpentane	ug/L	<0.087	20	20	21.3	22.3	107	111	48-150	4	30		
2,2-Dichloropropane	ug/L	<0.096	20	20	20.1	20.9	100	104	50-150	4	30		
2-Butanone (MEK)	ug/L	<1.1	100	100	87.5	90.5	87	90	58-125	3	30		
2-Chlorotoluene	ug/L	<0.084	20	20	18.8	20.5	94	103	65-138	9	30		
2-Hexanone	ug/L	<0.19	100	100	98.9	105	99	105	61-134	6	30		
4-Chlorotoluene	ug/L	<0.048	20	20	19.8	21.0	99	105	68-135	6	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	100	96.4	103	96	103	61-130	6	30		
Acetone	ug/L	4.3J	100	100	158	169	154	165	51-140	7	30	M1	
Acrolein	ug/L	<2.1	200	200	275	289	138	145	48-150	5	30		
Acrylonitrile	ug/L	<0.49	200	200	186	197	93	98	55-134	6	30		
Benzene	ug/L	<0.042	20	20	18.9	20.1	95	100	63-132	6	30		
Bromobenzene	ug/L	<0.087	20	20	19.5	21.1	98	105	67-138	8	30		
Bromochloromethane	ug/L	<0.082	20	20	20.8	21.0	104	105	66-138	1	30		
Bromodichloromethane	ug/L	<0.068	20	20	19.7	20.4	98	102	75-137	3	30		
Bromoform	ug/L	<0.11	20	20	17.5	18.4	87	92	65-129	5	30		
Bromomethane	ug/L	<0.20	20	20	22.8	22.4	114	112	41-150	2	30		
Carbon disulfide	ug/L	<0.20	20	20	20.0	21.2	100	106	72-132	6	30		
Carbon tetrachloride	ug/L	<0.079	20	20	19.9	21.4	100	107	75-150	7	30		
Chlorobenzene	ug/L	<0.066	20	20	18.7	20.0	93	100	73-127	7	30		
Chloroethane	ug/L	<0.12	20	20	22.5	22.4	113	112	74-138	1	30		
Chloroform	ug/L	<0.21	20	20	19.2	20.0	96	100	74-125	4	30		
Chloromethane	ug/L	<0.080	20	20	20.2	19.7	101	98	58-129	3	30		
cis-1,2-Dichloroethene	ug/L	0.21J	20	20	19.6	20.3	97	100	63-135	3	30		
cis-1,3-Dichloropropene	ug/L	<0.069	20	20	19.1	19.9	95	100	66-129	4	30		
Dibromochloromethane	ug/L	<0.048	20	20	19.2	20.5	96	102	75-133	6	30		

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### QUALITY CONTROL DATA

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Parameter	Units	10392001003		2617135		2617136		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<0.14	20	20	19.8	20.9	99	104	68-134	5	30		
Dichlorodifluoromethane	ug/L	<0.075	20	20	23.1	23.1	116	115	72-150	0	30		
Dichlorofluoromethane	ug/L	<0.054	20	20	21.6	21.6	108	108	75-129	0	30		
Diisopropyl ether	ug/L	<0.050	20	20	18.5	19.4	93	97	62-128	5	30		
Ethyl-tert-butyl ether	ug/L	<0.062	20	20	18.9	20.2	94	101	63-132	7	30		
Ethylbenzene	ug/L	<0.075	20	20	18.7	20.0	94	100	72-130	7	30		
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20	20.8	22.1	104	110	71-150	6	30		
Isopropylbenzene (Cumene)	ug/L	<0.064	20	20	19.7	20.9	98	105	70-136	6	30		
m&p-Xylene	ug/L	<0.11	40	40	38.0	40.9	95	102	64-142	7	30		
Methyl-tert-butyl ether	ug/L	<0.047	20	20	19.2	20.2	96	101	72-125	5	30		
Methylene Chloride	ug/L	<0.097	20	20	18.2	19.0	91	95	60-132	4	30		
n-Butylbenzene	ug/L	<0.16	20	20	20.8	22.2	104	111	60-150	6	30		
n-Propylbenzene	ug/L	<0.049	20	20	19.0	20.6	95	103	63-142	8	30		
Naphthalene	ug/L	<0.064	20	20	19.6	20.8	98	104	67-125	6	30		
o-Xylene	ug/L	<0.044	20	20	19.7	20.8	98	104	60-143	6	30		
p-Isopropyltoluene	ug/L	<0.064	20	20	19.7	21.1	99	105	64-146	7	30		
sec-Butylbenzene	ug/L	<0.094	20	20	19.8	21.4	99	107	67-144	8	30		
Styrene	ug/L	<0.056	20	20	19.7	20.7	99	104	67-136	5	30		
tert-Amylmethyl ether	ug/L	<0.073	20	20	18.9	19.6	95	98	60-134	3	30		
tert-Butyl Alcohol	ug/L	<0.89	200	200	195	206	98	103	56-146	5	30		
tert-Butylbenzene	ug/L	<0.051	20	20	18.9	20.5	94	103	68-135	9	30		
Tetrachloroethene	ug/L	<0.13	20	20	20.2	22.0	101	110	67-148	8	30		
Tetrahydrofuran	ug/L	<1.5	200	200	292	304	146	152	51-141	4	30	M1	
Toluene	ug/L	<0.059	20	20	19.5	20.4	97	102	61-140	5	30		
trans-1,2-Dichloroethene	ug/L	<0.15	20	20	19.0	20.6	95	103	62-138	8	30		
trans-1,3-Dichloropropene	ug/L	<0.044	20	20	18.7	19.8	93	99	67-134	6	30		
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	50	45.3	46.7	91	93	30-150	3	30		
Trichloroethene	ug/L	<0.044	20	20	20.0	21.1	100	105	64-149	5	30		
Trichlorofluoromethane	ug/L	<0.055	20	20	23.9	23.6	119	118	75-150	1	30		
Vinyl acetate	ug/L	<0.12	20	20	19.8	20.5	99	103	49-143	4	30		
Vinyl chloride	ug/L	<0.098	20	20	23.3	22.7	116	113	75-133	3	30		
Xylene (Total)	ug/L	<0.15	60	60	57.7	61.7	96	103	63-142	7	30		
1,2-Dichloroethane-d4 (S)	%						97	98	75-137				
4-Bromofluorobenzene (S)	%						100	101	75-125				
Toluene-d8 (S)	%						101	101	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

---

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 661508 1497 UPRR\_Freeman

Pace Project No.: 10392622

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10392622001	Trip Blank	EPA 8260B	480481		
10392622002	MW2OU-GW-depth-061517	EPA 8260B	480481		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10392622

### Section A

### Section B

### Section C

Required Client Information:

Required Project Information:

Invoice Information:

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR
Email: mark.Ochsner@ch2m.com	Purchase Order #:	Address: CAS
Phone: _____ Fax: _____	Project Name: UPRR Freeman	Pace Quote:
Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day <u>24</u>	Project #: 1061508 1497	Pace Project Manager:
		Pace Profile #: 36447 / 1

Page: 1 of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9, ., -) Sample Ids must be unique	MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test Y/N	Requested Analysis Filtered (Y/N)											Residual Chlorine (Y/N)						
			START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2SO3	Methanol	Other		Low Level VOCs by 8260																	
			DATE	TIME	DATE	TIME																													
1	TRIP BLANK	WT	6/15/17	1200	6/15/17	1205	2						X						X													001			
2	MW20U-GW-depth-061517	WT	6/15/17	1215	6/15/17	1220	3					X							X													002			
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* Requesting 2 day TAT	ZKB/CH2M	6-16-17	0921	Jace	6/17/17	9:00	3.7	Y	Y	Y
							2.7			

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Jenniter Ulrich	SIGNATURE of SAMPLER: <i>Jenniter Ulrich</i>	DATE Signed: 6/15/17				

<b>Sample Condition Upon Receipt - ESI Tech Specs</b>	<b>Client Name:</b> <u>CH2M Hill</u>	<b>Project #:</b> _____	WO# : 10392622
---	--------------------------------------	-------------------------	----------------



**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_

**Tracking Number:** \_\_\_\_\_

**Custody Seal on Cooler/Box Present?**  Yes     No    **Seals Intact?**  Yes     No

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_

**Thermometer Used:**  151401163     151401164    **Temp Blank?**  Yes     No

**Type of Ice:**  Wet     Blue     None     Samples on ice, cooling process has begun

**Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Cooler Temp Read (°C):** 2.63.6    **Cooler Temp Corrected (°C):** 2.73.7    **Biological Tissue Frozen?**  Yes     No     NA

Temp should be above freezing to 6°C    **Correction Factor:** +0.1    **Date and Initials of Person Examining Contents:** RGG/17/17

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>+trip blanks only</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>only 2 blanks</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>117210</u>	

**CLIENT NOTIFICATION/RESOLUTION**    **Field Data Required?**  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>12:22</u> Temp: <u>2.63.6</u> Corrected Temp: <u>2.73.7</u>	
Time: <u>12:39</u> put in cooler	
Time: _____ Temp: _____ Corrected Temp: _____	

**Project Manager Review:** \_\_\_\_\_ JENNI GROSS    **Date:** 06/19/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

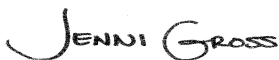
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392623

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10392623001	WS5-Eff-GW-061417	Water	06/14/17 07:40	06/17/17 09:00
10392623002	WS5-Inf-GW-061417	Water	06/14/17 08:40	06/17/17 09:00
10392623003	MW17D-GW-061417	Water	06/14/17 12:30	06/17/17 09:00
10392623004	W20-GW-061417	Water	06/14/17 15:55	06/17/17 09:00
10392623005	TB-061417	Water	06/14/17 07:00	06/17/17 09:00
10392623006	MW06D-GW-061517	Water	06/15/17 08:05	06/17/17 09:00
10392623007	MW19D-GW-061517	Water	06/15/17 10:40	06/17/17 09:00
10392623008	W26-GW-061517	Water	06/15/17 13:20	06/17/17 09:00
10392623009	TB-061517	Water	06/15/17 07:00	06/17/17 09:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10392623001	WS5-Eff-GW-061417	EPA 8260B	DJB	83	PASI-M
10392623002	WS5-Inf-GW-061417	EPA 8260B	DJB	83	PASI-M
10392623003	MW17D-GW-061417	EPA 8260B	DJB	83	PASI-M
10392623004	W20-GW-061417	EPA 8260B	DJB	83	PASI-M
10392623005	TB-061417	EPA 8260B	DJB	83	PASI-M
10392623006	MW06D-GW-061517	EPA 8260B	PRD	83	PASI-M
10392623007	MW19D-GW-061517	EPA 8260B	PRD	83	PASI-M
10392623008	W26-GW-061517	EPA 8260B	PRD	83	PASI-M
10392623009	TB-061517	EPA 8260B	PRD	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10392623002</b>	<b>WS5-Inf-GW-061417</b>					
EPA 8260B	Carbon tetrachloride	4.5	ug/L	0.50	06/25/17 07:58	
EPA 8260B	Chloroform	0.33J	ug/L	1.0	06/25/17 07:58	
EPA 8260B	Chloromethane	2.8J	ug/L	4.0	06/25/17 07:58	
<b>10392623003</b>	<b>MW17D-GW-061417</b>					
EPA 8260B	Carbon disulfide	7.7	ug/L	1.0	06/25/17 08:15	
<b>10392623004</b>	<b>W20-GW-061417</b>					
EPA 8260B	Acetone	5.4J	ug/L	20.0	06/25/17 08:31	
<b>10392623005</b>	<b>TB-061417</b>					
EPA 8260B	Naphthalene	0.18J	ug/L	1.0	06/25/17 04:12	B
<b>10392623006</b>	<b>MW06D-GW-061517</b>					
EPA 8260B	Acetone	13.0J	ug/L	20.0	06/26/17 19:35	CH,L1
EPA 8260B	Carbon tetrachloride	3.6	ug/L	0.50	06/26/17 19:35	
EPA 8260B	Chloroform	0.30J	ug/L	1.0	06/26/17 19:35	
<b>10392623007</b>	<b>MW19D-GW-061517</b>					
EPA 8260B	Carbon disulfide	1.1J	ug/L	2.0	06/26/17 19:51	
EPA 8260B	Carbon tetrachloride	412	ug/L	1.0	06/26/17 19:51	
EPA 8260B	Chloroform	25.0	ug/L	2.0	06/26/17 19:51	
<b>10392623008</b>	<b>W26-GW-061517</b>					
EPA 8260B	Carbon disulfide	0.26J	ug/L	1.0	06/26/17 19:19	
EPA 8260B	Carbon tetrachloride	34.6	ug/L	0.50	06/26/17 19:19	
EPA 8260B	Chloroform	2.5	ug/L	1.0	06/26/17 19:19	
<b>10392623009</b>	<b>TB-061517</b>					
EPA 8260B	Toluene	0.064J	ug/L	0.10	06/26/17 15:00	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 28, 2017

### General Information:

9 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 481483

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2623054)
  - Bromomethane
- LCSD (Lab ID: 2623397)
  - Bromomethane
- MS (Lab ID: 2623404)
  - Bromomethane

QC Batch: 481638

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2623548)
  - Acetone
- LCSD (Lab ID: 2623549)
  - Acetone
- MS (Lab ID: 2623638)
  - Acrolein
- MW06D-GW-061517 (Lab ID: 10392623006)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 481483

B: Analyte was detected in the associated method blank.

- BLANK for HBN 481483 [MSV/4044 (Lab ID: 2623053)]

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 28, 2017

QC Batch: 481483

B: Analyte was detected in the associated method blank.

- Naphthalene

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 481483

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2623054)
  - Chloroethane
- LCSD (Lab ID: 2623397)
  - Chloroethane

QC Batch: 481638

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2623548)
  - Acetone
- LCSD (Lab ID: 2623549)
  - Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2623548)
  - Chloroethane
- LCSD (Lab ID: 2623549)
  - Chloroethane

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2623549)
  - Bromomethane

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481483

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 481638

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **WS5-Eff-GW-061417** Lab ID: **10392623001** Collected: 06/14/17 07:40 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 07:42	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/25/17 07:42	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 07:42	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 07:42	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/25/17 07:42	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 07:42	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/25/17 07:42	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/25/17 07:42	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/25/17 07:42	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/25/17 07:42	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/25/17 07:42	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/25/17 07:42	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/25/17 07:42	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/25/17 07:42	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/25/17 07:42	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/25/17 07:42	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/25/17 07:42	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/25/17 07:42	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/25/17 07:42	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/25/17 07:42	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/25/17 07:42	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/25/17 07:42	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/25/17 07:42	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/25/17 07:42	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/25/17 07:42	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/25/17 07:42	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/25/17 07:42	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/25/17 07:42	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/25/17 07:42	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/25/17 07:42	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/25/17 07:42	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/25/17 07:42	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/25/17 07:42	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/25/17 07:42	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/25/17 07:42	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/25/17 07:42	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/25/17 07:42	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/25/17 07:42	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/25/17 07:42	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/25/17 07:42	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/25/17 07:42	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/25/17 07:42	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/25/17 07:42	75-00-3	L3
Chloroform	<0.21	ug/L	1.0	0.21	1		06/25/17 07:42	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/25/17 07:42	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/25/17 07:42	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

**Sample: WS5-Eff-GW-061417**      **Lab ID: 10392623001**      Collected: 06/14/17 07:40      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/25/17 07:42	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/25/17 07:42	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/25/17 07:42	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/25/17 07:42	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/25/17 07:42	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/25/17 07:42	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/25/17 07:42	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/25/17 07:42	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/25/17 07:42	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/25/17 07:42	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/25/17 07:42	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/25/17 07:42	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/25/17 07:42	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/25/17 07:42	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/25/17 07:42	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/25/17 07:42	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/25/17 07:42	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/25/17 07:42	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/25/17 07:42	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/25/17 07:42	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/25/17 07:42	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/25/17 07:42	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/25/17 07:42	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/25/17 07:42	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/25/17 07:42	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/25/17 07:42	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/25/17 07:42	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/25/17 07:42	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/25/17 07:42	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/25/17 07:42	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/25/17 07:42	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/25/17 07:42	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/25/17 07:42	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/25/17 07:42	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	123	%	75-137		1		06/25/17 07:42	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/25/17 07:42	2037-26-5	
4-Bromofluorobenzene (S)	107	%	75-125		1		06/25/17 07:42	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **WS5-Inf-GW-061417** Lab ID: **10392623002** Collected: 06/14/17 08:40 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 07:58	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/25/17 07:58	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 07:58	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 07:58	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/25/17 07:58	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 07:58	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/25/17 07:58	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/25/17 07:58	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/25/17 07:58	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/25/17 07:58	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/25/17 07:58	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/25/17 07:58	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/25/17 07:58	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/25/17 07:58	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/25/17 07:58	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/25/17 07:58	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/25/17 07:58	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/25/17 07:58	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/25/17 07:58	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/25/17 07:58	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/25/17 07:58	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/25/17 07:58	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/25/17 07:58	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/25/17 07:58	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/25/17 07:58	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/25/17 07:58	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/25/17 07:58	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/25/17 07:58	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/25/17 07:58	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/25/17 07:58	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/25/17 07:58	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/25/17 07:58	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/25/17 07:58	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/25/17 07:58	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/25/17 07:58	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/25/17 07:58	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/25/17 07:58	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/25/17 07:58	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/25/17 07:58	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/25/17 07:58	75-15-0	
Carbon tetrachloride	4.5	ug/L	0.50	0.079	1		06/25/17 07:58	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/25/17 07:58	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/25/17 07:58	75-00-3	L3
Chloroform	0.33J	ug/L	1.0	0.21	1		06/25/17 07:58	67-66-3	
Chloromethane	2.8J	ug/L	4.0	0.080	1		06/25/17 07:58	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/25/17 07:58	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

**Sample: WS5-Inf-GW-061417**      **Lab ID: 10392623002**      Collected: 06/14/17 08:40      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/25/17 07:58	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/25/17 07:58	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/25/17 07:58	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/25/17 07:58	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/25/17 07:58	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/25/17 07:58	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/25/17 07:58	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/25/17 07:58	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/25/17 07:58	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/25/17 07:58	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/25/17 07:58	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/25/17 07:58	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/25/17 07:58	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/25/17 07:58	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/25/17 07:58	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/25/17 07:58	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/25/17 07:58	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/25/17 07:58	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/25/17 07:58	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/25/17 07:58	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/25/17 07:58	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/25/17 07:58	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/25/17 07:58	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/25/17 07:58	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/25/17 07:58	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/25/17 07:58	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/25/17 07:58	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/25/17 07:58	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/25/17 07:58	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/25/17 07:58	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/25/17 07:58	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/25/17 07:58	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/25/17 07:58	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/25/17 07:58	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	120	%	75-137		1		06/25/17 07:58	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		06/25/17 07:58	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1		06/25/17 07:58	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: MW17D-GW-061417 Lab ID: 10392623003 Collected: 06/14/17 12:30 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 08:15	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/25/17 08:15	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 08:15	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 08:15	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/25/17 08:15	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 08:15	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/25/17 08:15	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/25/17 08:15	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/25/17 08:15	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/25/17 08:15	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/25/17 08:15	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/25/17 08:15	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/25/17 08:15	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/25/17 08:15	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/25/17 08:15	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/25/17 08:15	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/25/17 08:15	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/25/17 08:15	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/25/17 08:15	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/25/17 08:15	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/25/17 08:15	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/25/17 08:15	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/25/17 08:15	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/25/17 08:15	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/25/17 08:15	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/25/17 08:15	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/25/17 08:15	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/25/17 08:15	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/25/17 08:15	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/25/17 08:15	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/25/17 08:15	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/25/17 08:15	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/25/17 08:15	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/25/17 08:15	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/25/17 08:15	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/25/17 08:15	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/25/17 08:15	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/25/17 08:15	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/25/17 08:15	74-83-9	
Carbon disulfide	7.7	ug/L	1.0	0.20	1		06/25/17 08:15	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/25/17 08:15	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/25/17 08:15	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/25/17 08:15	75-00-3	L3
Chloroform	<0.21	ug/L	1.0	0.21	1		06/25/17 08:15	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/25/17 08:15	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/25/17 08:15	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: MW17D-GW-061417 Lab ID: 10392623003 Collected: 06/14/17 12:30 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/25/17 08:15	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/25/17 08:15	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/25/17 08:15	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/25/17 08:15	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/25/17 08:15	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/25/17 08:15	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/25/17 08:15	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/25/17 08:15	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/25/17 08:15	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/25/17 08:15	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/25/17 08:15	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/25/17 08:15	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/25/17 08:15	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/25/17 08:15	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/25/17 08:15	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/25/17 08:15	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/25/17 08:15	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/25/17 08:15	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/25/17 08:15	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/25/17 08:15	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/25/17 08:15	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/25/17 08:15	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/25/17 08:15	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/25/17 08:15	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/25/17 08:15	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/25/17 08:15	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/25/17 08:15	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/25/17 08:15	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/25/17 08:15	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/25/17 08:15	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/25/17 08:15	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/25/17 08:15	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/25/17 08:15	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/25/17 08:15	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	116	%	75-137		1		06/25/17 08:15	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/25/17 08:15	2037-26-5	
4-Bromofluorobenzene (S)	106	%	75-125		1		06/25/17 08:15	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **W20-GW-061417** Lab ID: **10392623004** Collected: 06/14/17 15:55 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 08:31	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/25/17 08:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 08:31	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 08:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/25/17 08:31	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 08:31	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/25/17 08:31	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/25/17 08:31	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/25/17 08:31	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/25/17 08:31	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/25/17 08:31	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/25/17 08:31	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/25/17 08:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/25/17 08:31	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/25/17 08:31	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/25/17 08:31	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/25/17 08:31	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/25/17 08:31	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/25/17 08:31	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/25/17 08:31	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/25/17 08:31	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/25/17 08:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/25/17 08:31	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/25/17 08:31	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/25/17 08:31	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/25/17 08:31	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/25/17 08:31	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/25/17 08:31	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/25/17 08:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/25/17 08:31	108-10-1	
Acetone	5.4J	ug/L	20.0	0.64	1		06/25/17 08:31	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/25/17 08:31	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/25/17 08:31	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/25/17 08:31	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/25/17 08:31	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/25/17 08:31	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/25/17 08:31	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/25/17 08:31	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/25/17 08:31	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/25/17 08:31	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/25/17 08:31	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/25/17 08:31	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/25/17 08:31	75-00-3	L3
Chloroform	<0.21	ug/L	1.0	0.21	1		06/25/17 08:31	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/25/17 08:31	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/25/17 08:31	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **W20-GW-061417** Lab ID: **10392623004** Collected: 06/14/17 15:55 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/25/17 08:31	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/25/17 08:31	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/25/17 08:31	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/25/17 08:31	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/25/17 08:31	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/25/17 08:31	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/25/17 08:31	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/25/17 08:31	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/25/17 08:31	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/25/17 08:31	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/25/17 08:31	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/25/17 08:31	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/25/17 08:31	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/25/17 08:31	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/25/17 08:31	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/25/17 08:31	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/25/17 08:31	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/25/17 08:31	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/25/17 08:31	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/25/17 08:31	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/25/17 08:31	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/25/17 08:31	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/25/17 08:31	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/25/17 08:31	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/25/17 08:31	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/25/17 08:31	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/25/17 08:31	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/25/17 08:31	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/25/17 08:31	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/25/17 08:31	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/25/17 08:31	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/25/17 08:31	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/25/17 08:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/25/17 08:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	121	%	75-137		1		06/25/17 08:31	17060-07-0	HS
Toluene-d8 (S)	100	%	75-125		1		06/25/17 08:31	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		06/25/17 08:31	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: TB-061417 Lab ID: 10392623005 Collected: 06/14/17 07:00 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 04:12	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/25/17 04:12	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 04:12	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/25/17 04:12	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/25/17 04:12	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/25/17 04:12	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/25/17 04:12	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/25/17 04:12	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/25/17 04:12	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/25/17 04:12	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/25/17 04:12	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/25/17 04:12	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/25/17 04:12	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/25/17 04:12	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/25/17 04:12	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/25/17 04:12	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/25/17 04:12	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/25/17 04:12	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/25/17 04:12	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/25/17 04:12	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/25/17 04:12	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/25/17 04:12	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/25/17 04:12	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/25/17 04:12	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/25/17 04:12	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/25/17 04:12	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/25/17 04:12	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/25/17 04:12	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/25/17 04:12	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/25/17 04:12	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/25/17 04:12	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		06/25/17 04:12	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/25/17 04:12	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/25/17 04:12	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/25/17 04:12	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/25/17 04:12	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/25/17 04:12	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/25/17 04:12	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/25/17 04:12	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/25/17 04:12	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/25/17 04:12	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/25/17 04:12	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/25/17 04:12	75-00-3	L3
Chloroform	<0.21	ug/L	1.0	0.21	1		06/25/17 04:12	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/25/17 04:12	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/25/17 04:12	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

**Sample: TB-061417**      **Lab ID: 10392623005**      Collected: 06/14/17 07:00      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/25/17 04:12	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/25/17 04:12	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/25/17 04:12	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/25/17 04:12	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/25/17 04:12	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/25/17 04:12	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/25/17 04:12	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/25/17 04:12	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/25/17 04:12	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/25/17 04:12	75-09-2	
Naphthalene	0.18J	ug/L	1.0	0.064	1		06/25/17 04:12	91-20-3	B
Styrene	<0.056	ug/L	0.50	0.056	1		06/25/17 04:12	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/25/17 04:12	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/25/17 04:12	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/25/17 04:12	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/25/17 04:12	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/25/17 04:12	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/25/17 04:12	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/25/17 04:12	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/25/17 04:12	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/25/17 04:12	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/25/17 04:12	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/25/17 04:12	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/25/17 04:12	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/25/17 04:12	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/25/17 04:12	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/25/17 04:12	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/25/17 04:12	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/25/17 04:12	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/25/17 04:12	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/25/17 04:12	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/25/17 04:12	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/25/17 04:12	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/25/17 04:12	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	121	%	75-137		1		06/25/17 04:12	17060-07-0	HS
Toluene-d8 (S)	101	%	75-125		1		06/25/17 04:12	2037-26-5	
4-Bromofluorobenzene (S)	106	%	75-125		1		06/25/17 04:12	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **MW06D-GW-061517** Lab ID: **10392623006** Collected: 06/15/17 08:05 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/26/17 19:35	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/26/17 19:35	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/26/17 19:35	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/26/17 19:35	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/26/17 19:35	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/26/17 19:35	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/26/17 19:35	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/26/17 19:35	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/26/17 19:35	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/26/17 19:35	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/26/17 19:35	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/26/17 19:35	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/26/17 19:35	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/26/17 19:35	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/26/17 19:35	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/26/17 19:35	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/26/17 19:35	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/26/17 19:35	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/26/17 19:35	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/26/17 19:35	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/26/17 19:35	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/26/17 19:35	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/26/17 19:35	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/26/17 19:35	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/26/17 19:35	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/26/17 19:35	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/26/17 19:35	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/26/17 19:35	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/26/17 19:35	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/26/17 19:35	108-10-1	
Acetone	13.0J	ug/L	20.0	0.64	1		06/26/17 19:35	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/26/17 19:35	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/26/17 19:35	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/26/17 19:35	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/26/17 19:35	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/26/17 19:35	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/26/17 19:35	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/26/17 19:35	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/26/17 19:35	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/26/17 19:35	75-15-0	
Carbon tetrachloride	3.6	ug/L	0.50	0.079	1		06/26/17 19:35	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/26/17 19:35	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/26/17 19:35	75-00-3	
Chloroform	0.30J	ug/L	1.0	0.21	1		06/26/17 19:35	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/26/17 19:35	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/26/17 19:35	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

**Sample: MW06D-GW-061517**      **Lab ID: 10392623006**      Collected: 06/15/17 08:05      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/26/17 19:35	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/26/17 19:35	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/26/17 19:35	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/26/17 19:35	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/26/17 19:35	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/26/17 19:35	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/26/17 19:35	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/26/17 19:35	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/26/17 19:35	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/26/17 19:35	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/26/17 19:35	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/26/17 19:35	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/26/17 19:35	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/26/17 19:35	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/26/17 19:35	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/26/17 19:35	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/26/17 19:35	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/26/17 19:35	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/26/17 19:35	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/26/17 19:35	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/26/17 19:35	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/26/17 19:35	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/26/17 19:35	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/26/17 19:35	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/26/17 19:35	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/26/17 19:35	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/26/17 19:35	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/26/17 19:35	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/26/17 19:35	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/26/17 19:35	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/26/17 19:35	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/26/17 19:35	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/26/17 19:35	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/26/17 19:35	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	119	%	75-137		1		06/26/17 19:35	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/26/17 19:35	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/26/17 19:35	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: MW19D-GW-061517 Lab ID: 10392623007 Collected: 06/15/17 10:40 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.13	ug/L	1.0	0.13	2		06/26/17 19:51	630-20-6	
1,1,1-Trichloroethane	<0.11	ug/L	1.0	0.11	2		06/26/17 19:51	71-55-6	
1,1,2,2-Tetrachloroethane	<0.11	ug/L	1.0	0.11	2		06/26/17 19:51	79-34-5	
1,1,2-Trichloroethane	<0.13	ug/L	1.0	0.13	2		06/26/17 19:51	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.26	ug/L	2.0	0.26	2		06/26/17 19:51	76-13-1	
1,1-Dichloroethane	<0.11	ug/L	1.0	0.11	2		06/26/17 19:51	75-34-3	
1,1-Dichloroethene	<0.14	ug/L	1.0	0.14	2		06/26/17 19:51	75-35-4	
1,1-Dichloropropene	<0.16	ug/L	1.0	0.16	2		06/26/17 19:51	563-58-6	
1,2,3-Trichlorobenzene	<0.34	ug/L	1.0	0.34	2		06/26/17 19:51	87-61-6	
1,2,3-Trichloropropane	<0.38	ug/L	8.0	0.38	2		06/26/17 19:51	96-18-4	
1,2,4-Trichlorobenzene	<0.28	ug/L	1.0	0.28	2		06/26/17 19:51	120-82-1	
1,2,4-Trimethylbenzene	<0.14	ug/L	1.0	0.14	2		06/26/17 19:51	95-63-6	
1,2-Dibromo-3-chloropropane	<1.2	ug/L	8.0	1.2	2		06/26/17 19:51	96-12-8	
1,2-Dibromoethane (EDB)	<0.18	ug/L	1.0	0.18	2		06/26/17 19:51	106-93-4	
1,2-Dichlorobenzene	<0.16	ug/L	1.0	0.16	2		06/26/17 19:51	95-50-1	
1,2-Dichloroethane	<0.14	ug/L	2.0	0.14	2		06/26/17 19:51	107-06-2	
1,2-Dichloroethene (Total)	<0.33	ug/L	2.0	0.33	2		06/26/17 19:51	540-59-0	
1,2-Dichloropropane	<0.13	ug/L	8.0	0.13	2		06/26/17 19:51	78-87-5	
1,3,5-Trimethylbenzene	<0.084	ug/L	1.0	0.084	2		06/26/17 19:51	108-67-8	
1,3-Dichlorobenzene	<0.17	ug/L	1.0	0.17	2		06/26/17 19:51	541-73-1	
1,3-Dichloropropane	<0.12	ug/L	1.0	0.12	2		06/26/17 19:51	142-28-9	
1,4-Dichlorobenzene	<0.16	ug/L	1.0	0.16	2		06/26/17 19:51	106-46-7	
1,4-Dioxane (p-Dioxane)	<9.6	ug/L	400	9.6	2		06/26/17 19:51	123-91-1	
2,2,4-Trimethylpentane	<0.17	ug/L	8.0	0.17	2		06/26/17 19:51	540-84-1	
2,2-Dichloropropane	<0.19	ug/L	2.0	0.19	2		06/26/17 19:51	594-20-7	
2-Butanone (MEK)	<2.2	ug/L	10.0	2.2	2		06/26/17 19:51	78-93-3	
2-Chlorotoluene	<0.17	ug/L	1.0	0.17	2		06/26/17 19:51	95-49-8	
2-Hexanone	<0.38	ug/L	10.0	0.38	2		06/26/17 19:51	591-78-6	
4-Chlorotoluene	<0.096	ug/L	1.0	0.096	2		06/26/17 19:51	106-43-4	
4-Methyl-2-pentanone (MIBK)	<1.6	ug/L	10.0	1.6	2		06/26/17 19:51	108-10-1	
Acetone	<1.3	ug/L	40.0	1.3	2		06/26/17 19:51	67-64-1	L3
Acrolein	<4.2	ug/L	20.0	4.2	2		06/26/17 19:51	107-02-8	
Acrylonitrile	<0.98	ug/L	20.0	0.98	2		06/26/17 19:51	107-13-1	
Benzene	<0.084	ug/L	1.0	0.084	2		06/26/17 19:51	71-43-2	
Bromobenzene	<0.17	ug/L	1.0	0.17	2		06/26/17 19:51	108-86-1	
Bromochloromethane	<0.16	ug/L	2.0	0.16	2		06/26/17 19:51	74-97-5	
Bromodichloromethane	<0.14	ug/L	1.0	0.14	2		06/26/17 19:51	75-27-4	
Bromoform	<0.22	ug/L	8.0	0.22	2		06/26/17 19:51	75-25-2	
Bromomethane	<0.40	ug/L	8.0	0.40	2		06/26/17 19:51	74-83-9	
Carbon disulfide	1.1J	ug/L	2.0	0.40	2		06/26/17 19:51	75-15-0	
Carbon tetrachloride	412	ug/L	1.0	0.16	2		06/26/17 19:51	56-23-5	
Chlorobenzene	<0.13	ug/L	1.0	0.13	2		06/26/17 19:51	108-90-7	
Chloroethane	<0.24	ug/L	8.0	0.24	2		06/26/17 19:51	75-00-3	
Chloroform	25.0	ug/L	2.0	0.42	2		06/26/17 19:51	67-66-3	
Chloromethane	<0.16	ug/L	8.0	0.16	2		06/26/17 19:51	74-87-3	
Dibromochloromethane	<0.096	ug/L	1.0	0.096	2		06/26/17 19:51	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: MW19D-GW-061517 Lab ID: 10392623007 Collected: 06/15/17 10:40 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.28	ug/L	2.0	0.28	2		06/26/17 19:51	74-95-3	
Dichlorodifluoromethane	<0.15	ug/L	8.0	0.15	2		06/26/17 19:51	75-71-8	
Dichlorofluoromethane	<0.11	ug/L	2.0	0.11	2		06/26/17 19:51	75-43-4	
Diisopropyl ether	<0.10	ug/L	2.0	0.10	2		06/26/17 19:51	108-20-3	
Ethyl-tert-butyl ether	<0.12	ug/L	1.0	0.12	2		06/26/17 19:51	637-92-3	
Ethylbenzene	<0.15	ug/L	1.0	0.15	2		06/26/17 19:51	100-41-4	
Hexachloro-1,3-butadiene	<0.26	ug/L	2.0	0.26	2		06/26/17 19:51	87-68-3	
Isopropylbenzene (Cumene)	<0.13	ug/L	1.0	0.13	2		06/26/17 19:51	98-82-8	
Methyl-tert-butyl ether	<0.094	ug/L	1.0	0.094	2		06/26/17 19:51	1634-04-4	
Methylene Chloride	<0.19	ug/L	8.0	0.19	2		06/26/17 19:51	75-09-2	
Naphthalene	<0.13	ug/L	2.0	0.13	2		06/26/17 19:51	91-20-3	
Styrene	<0.11	ug/L	1.0	0.11	2		06/26/17 19:51	100-42-5	
Tetrachloroethene	<0.26	ug/L	1.0	0.26	2		06/26/17 19:51	127-18-4	
Tetrahydrofuran	<3.0	ug/L	20.0	3.0	2		06/26/17 19:51	109-99-9	
Toluene	<0.12	ug/L	0.20	0.12	2		06/26/17 19:51	108-88-3	
Trichloroethene	<0.088	ug/L	0.80	0.088	2		06/26/17 19:51	79-01-6	
Trichlorofluoromethane	<0.11	ug/L	8.0	0.11	2		06/26/17 19:51	75-69-4	
Vinyl acetate	<0.24	ug/L	20.0	0.24	2		06/26/17 19:51	108-05-4	
Vinyl chloride	<0.20	ug/L	0.40	0.20	2		06/26/17 19:51	75-01-4	
Xylene (Total)	<0.31	ug/L	3.0	0.31	2		06/26/17 19:51	1330-20-7	
cis-1,2-Dichloroethene	<0.24	ug/L	1.0	0.24	2		06/26/17 19:51	156-59-2	
cis-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	2		06/26/17 19:51	10061-01-5	
m&p-Xylene	<0.22	ug/L	2.0	0.22	2		06/26/17 19:51	179601-23-1	
n-Butylbenzene	<0.32	ug/L	1.0	0.32	2		06/26/17 19:51	104-51-8	
n-Propylbenzene	<0.098	ug/L	1.0	0.098	2		06/26/17 19:51	103-65-1	
o-Xylene	<0.088	ug/L	1.0	0.088	2		06/26/17 19:51	95-47-6	
p-Isopropyltoluene	<0.13	ug/L	1.0	0.13	2		06/26/17 19:51	99-87-6	
sec-Butylbenzene	<0.19	ug/L	1.0	0.19	2		06/26/17 19:51	135-98-8	
tert-Amylmethyl ether	<0.15	ug/L	1.0	0.15	2		06/26/17 19:51	994-05-8	
tert-Butyl Alcohol	<1.8	ug/L	20.0	1.8	2		06/26/17 19:51	75-65-0	
tert-Butylbenzene	<0.10	ug/L	1.0	0.10	2		06/26/17 19:51	98-06-6	
trans-1,2-Dichloroethene	<0.30	ug/L	1.0	0.30	2		06/26/17 19:51	156-60-5	
trans-1,3-Dichloropropene	<0.088	ug/L	2.0	0.088	2		06/26/17 19:51	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.90	ug/L	20.0	0.90	2		06/26/17 19:51	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	120	%	75-137		2		06/26/17 19:51	17060-07-0	
Toluene-d8 (S)	97	%	75-125		2		06/26/17 19:51	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		2		06/26/17 19:51	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **W26-GW-061517** Lab ID: **10392623008** Collected: 06/15/17 13:20 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/26/17 19:19	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/26/17 19:19	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/26/17 19:19	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/26/17 19:19	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/26/17 19:19	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/26/17 19:19	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/26/17 19:19	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/26/17 19:19	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/26/17 19:19	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/26/17 19:19	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/26/17 19:19	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/26/17 19:19	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/26/17 19:19	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/26/17 19:19	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/26/17 19:19	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/26/17 19:19	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/26/17 19:19	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/26/17 19:19	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/26/17 19:19	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/26/17 19:19	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/26/17 19:19	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/26/17 19:19	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/26/17 19:19	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/26/17 19:19	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/26/17 19:19	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/26/17 19:19	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/26/17 19:19	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/26/17 19:19	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/26/17 19:19	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/26/17 19:19	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/26/17 19:19	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/26/17 19:19	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/26/17 19:19	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/26/17 19:19	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/26/17 19:19	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/26/17 19:19	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/26/17 19:19	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/26/17 19:19	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/26/17 19:19	74-83-9	
Carbon disulfide	0.26J	ug/L	1.0	0.20	1		06/26/17 19:19	75-15-0	
Carbon tetrachloride	34.6	ug/L	0.50	0.079	1		06/26/17 19:19	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/26/17 19:19	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/26/17 19:19	75-00-3	
Chloroform	2.5	ug/L	1.0	0.21	1		06/26/17 19:19	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/26/17 19:19	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/26/17 19:19	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Sample: **W26-GW-061517** Lab ID: **10392623008** Collected: 06/15/17 13:20 Received: 06/17/17 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/26/17 19:19	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/26/17 19:19	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/26/17 19:19	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/26/17 19:19	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/26/17 19:19	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/26/17 19:19	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/26/17 19:19	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/26/17 19:19	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/26/17 19:19	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/26/17 19:19	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/26/17 19:19	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/26/17 19:19	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/26/17 19:19	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/26/17 19:19	109-99-9	
Toluene	<0.059	ug/L	0.10	0.059	1		06/26/17 19:19	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/26/17 19:19	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/26/17 19:19	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/26/17 19:19	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/26/17 19:19	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/26/17 19:19	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/26/17 19:19	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/26/17 19:19	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/26/17 19:19	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/26/17 19:19	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/26/17 19:19	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/26/17 19:19	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/26/17 19:19	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/26/17 19:19	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/26/17 19:19	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/26/17 19:19	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/26/17 19:19	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/26/17 19:19	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/26/17 19:19	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/26/17 19:19	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	119	%	75-137		1		06/26/17 19:19	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/26/17 19:19	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		06/26/17 19:19	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

**Sample: TB-061517**      **Lab ID: 10392623009**      Collected: 06/15/17 07:00      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/26/17 15:00	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/26/17 15:00	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/26/17 15:00	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/26/17 15:00	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/26/17 15:00	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/26/17 15:00	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/26/17 15:00	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/26/17 15:00	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	0.50	0.17	1		06/26/17 15:00	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/26/17 15:00	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		06/26/17 15:00	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/26/17 15:00	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/26/17 15:00	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/26/17 15:00	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/26/17 15:00	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	1.0	0.072	1		06/26/17 15:00	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/26/17 15:00	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/26/17 15:00	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/26/17 15:00	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/26/17 15:00	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/26/17 15:00	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/26/17 15:00	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/26/17 15:00	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/26/17 15:00	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/26/17 15:00	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/26/17 15:00	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/26/17 15:00	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/26/17 15:00	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/26/17 15:00	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/26/17 15:00	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/26/17 15:00	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/26/17 15:00	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/26/17 15:00	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/26/17 15:00	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/26/17 15:00	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/26/17 15:00	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/26/17 15:00	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/26/17 15:00	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/26/17 15:00	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/26/17 15:00	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/26/17 15:00	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/26/17 15:00	108-90-7	
Chloroethane	<0.12	ug/L	4.0	0.12	1		06/26/17 15:00	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/26/17 15:00	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/26/17 15:00	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/26/17 15:00	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

**Sample: TB-061517**      **Lab ID: 10392623009**      Collected: 06/15/17 07:00      Received: 06/17/17 09:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/26/17 15:00	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	4.0	0.075	1		06/26/17 15:00	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/26/17 15:00	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/26/17 15:00	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/26/17 15:00	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/26/17 15:00	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/26/17 15:00	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/26/17 15:00	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/26/17 15:00	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/26/17 15:00	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/26/17 15:00	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/26/17 15:00	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/26/17 15:00	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/26/17 15:00	109-99-9	
Toluene	0.064J	ug/L	0.10	0.059	1		06/26/17 15:00	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/26/17 15:00	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	4.0	0.055	1		06/26/17 15:00	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/26/17 15:00	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/26/17 15:00	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/26/17 15:00	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/26/17 15:00	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/26/17 15:00	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/26/17 15:00	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/26/17 15:00	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/26/17 15:00	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/26/17 15:00	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/26/17 15:00	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/26/17 15:00	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/26/17 15:00	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/26/17 15:00	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/26/17 15:00	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/26/17 15:00	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	1.0	0.044	1		06/26/17 15:00	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/26/17 15:00	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	120	%	75-137		1		06/26/17 15:00	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/26/17 15:00	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1		06/26/17 15:00	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392623

QC Batch: 481483 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10392623001, 10392623002, 10392623003, 10392623004, 10392623005

METHOD BLANK: 2623053 Matrix: Water  
Associated Lab Samples: 10392623001, 10392623002, 10392623003, 10392623004, 10392623005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/25/17 03:39	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/25/17 03:39	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/25/17 03:39	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/25/17 03:39	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/25/17 03:39	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/25/17 03:39	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/25/17 03:39	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/25/17 03:39	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/25/17 03:39	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/25/17 03:39	
1,2,4-Trichlorobenzene	ug/L	0.18J	0.50	0.14	06/25/17 03:39	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/25/17 03:39	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/25/17 03:39	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/25/17 03:39	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/25/17 03:39	
1,2-Dichloroethane	ug/L	<0.072	1.0	0.072	06/25/17 03:39	MN
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/25/17 03:39	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/25/17 03:39	
1,3,5-Trimethylbenzene	ug/L	0.047J	0.50	0.042	06/25/17 03:39	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/25/17 03:39	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/25/17 03:39	
1,4-Dichlorobenzene	ug/L	0.19J	0.50	0.081	06/25/17 03:39	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/25/17 03:39	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/25/17 03:39	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/25/17 03:39	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/25/17 03:39	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/25/17 03:39	
2-Hexanone	ug/L	0.22J	5.0	0.19	06/25/17 03:39	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/25/17 03:39	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/25/17 03:39	
Acetone	ug/L	<0.64	20.0	0.64	06/25/17 03:39	
Acrolein	ug/L	<2.1	10.0	2.1	06/25/17 03:39	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/25/17 03:39	
Benzene	ug/L	<0.042	0.50	0.042	06/25/17 03:39	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/25/17 03:39	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/25/17 03:39	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/25/17 03:39	
Bromoform	ug/L	<0.11	4.0	0.11	06/25/17 03:39	
Bromomethane	ug/L	0.50J	4.0	0.20	06/25/17 03:39	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/25/17 03:39	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/25/17 03:39	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

METHOD BLANK: 2623053

Matrix: Water

Associated Lab Samples: 10392623001, 10392623002, 10392623003, 10392623004, 10392623005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/25/17 03:39	
Chloroethane	ug/L	<0.12	4.0	0.12	06/25/17 03:39	MN
Chloroform	ug/L	<0.21	1.0	0.21	06/25/17 03:39	
Chloromethane	ug/L	<0.080	4.0	0.080	06/25/17 03:39	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/25/17 03:39	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/25/17 03:39	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/25/17 03:39	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/25/17 03:39	
Dichlorodifluoromethane	ug/L	<0.075	4.0	0.075	06/25/17 03:39	MN
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/25/17 03:39	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/25/17 03:39	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/25/17 03:39	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/25/17 03:39	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/25/17 03:39	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/25/17 03:39	
m&p-Xylene	ug/L	0.15J	1.0	0.11	06/25/17 03:39	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/25/17 03:39	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/25/17 03:39	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/25/17 03:39	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/25/17 03:39	
Naphthalene	ug/L	0.29J	1.0	0.064	06/25/17 03:39	
o-Xylene	ug/L	<0.044	0.50	0.044	06/25/17 03:39	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/25/17 03:39	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/25/17 03:39	
Styrene	ug/L	<0.056	0.50	0.056	06/25/17 03:39	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/25/17 03:39	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/25/17 03:39	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/25/17 03:39	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/25/17 03:39	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/25/17 03:39	
Toluene	ug/L	<0.059	0.10	0.059	06/25/17 03:39	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/25/17 03:39	
trans-1,3-Dichloropropene	ug/L	<0.044	1.0	0.044	06/25/17 03:39	MN
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/25/17 03:39	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/25/17 03:39	
Trichlorofluoromethane	ug/L	<0.055	4.0	0.055	06/25/17 03:39	MN
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/25/17 03:39	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/25/17 03:39	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/25/17 03:39	
1,2-Dichloroethane-d4 (S)	%	120	75-137		06/25/17 03:39	
4-Bromofluorobenzene (S)	%	105	75-125		06/25/17 03:39	
Toluene-d8 (S)	%	100	75-125		06/25/17 03:39	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

LABORATORY CONTROL SAMPLE & LCSD: 2623054		2623397									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	21.3	21.4	106	107	75-136	1	30		
1,1,1-Trichloroethane	ug/L	20	22.5	22.0	113	110	75-129	2	30		
1,1,2,2-Tetrachloroethane	ug/L	20	21.1	21.2	106	106	71-138	0	30		
1,1,2-Trichloroethane	ug/L	20	21.5	19.8	108	99	75-125	8	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	22.1	21.3	110	106	69-126	4	30		
1,1-Dichloroethane	ug/L	20	24.3	22.9	122	114	75-125	6	30		
1,1-Dichloroethene	ug/L	20	21.0	19.2	105	96	75-125	9	30		
1,1-Dichloropropene	ug/L	20	24.5	23.0	122	115	75-125	6	30		
1,2,3-Trichlorobenzene	ug/L	20	18.6	18.9	93	95	75-125	2	30		
1,2,3-Trichloropropane	ug/L	20	19.9	20.3	99	102	75-125	2	30		
1,2,4-Trichlorobenzene	ug/L	20	20.2	19.9	101	100	75-125	1	30		
1,2,4-Trimethylbenzene	ug/L	20	21.4	20.6	107	103	75-125	4	30		
1,2-Dibromo-3-chloropropane	ug/L	50	44.5	47.0	89	94	71-130	5	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.1	20.4	100	102	75-125	2	30		
1,2-Dichlorobenzene	ug/L	20	18.3	18.1	91	91	75-125	1	30		
1,2-Dichloroethane	ug/L	20	24.0	23.6	120	118	70-125	2	30		
1,2-Dichloroethene (Total)	ug/L	40	42.5	41.3	106	103	75-125	3	30		
1,2-Dichloropropane	ug/L	20	23.6	22.6	118	113	75-125	4	30		
1,3,5-Trimethylbenzene	ug/L	20	21.6	21.1	108	106	75-125	2	30		
1,3-Dichlorobenzene	ug/L	20	19.0	18.2	95	91	75-125	4	30		
1,3-Dichloropropane	ug/L	20	22.4	22.3	112	111	75-125	0	30		
1,4-Dichlorobenzene	ug/L	20	18.6	17.8	93	89	75-125	5	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	364	369	91	92	64-140	1	30		
2,2,4-Trimethylpentane	ug/L	20	23.7	21.3	118	107	68-125	10	30		
2,2-Dichloropropane	ug/L	20	23.6	21.9	118	110	70-131	8	30		
2-Butanone (MEK)	ug/L	100	112	108	112	108	69-125	3	30		
2-Chlorotoluene	ug/L	20	20.8	19.9	104	99	75-125	4	30		
2-Hexanone	ug/L	100	117	120	117	120	73-129	3	30		
4-Chlorotoluene	ug/L	20	20.2	19.5	101	98	75-125	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	122	116	122	73-125	6	30		
Acetone	ug/L	100	92.1	99.3	92	99	66-126	8	30		
Acrolein	ug/L	200	226	227	113	113	56-150	0	30		
Acrylonitrile	ug/L	200	209	208	105	104	68-129	1	30		
Benzene	ug/L	20	21.4	19.4	107	97	75-125	10	30		
Bromobenzene	ug/L	20	18.9	18.2	94	91	75-125	4	30		
Bromochloromethane	ug/L	20	20.8	19.9	104	100	75-126	4	30		
Bromodichloromethane	ug/L	20	21.7	22.1	108	111	75-133	2	30		
Bromoform	ug/L	20	20.7	20.2	103	101	62-142	2	30		
Bromomethane	ug/L	20	28.6	25.8	143	129	34-143	10	30	CH	
Carbon disulfide	ug/L	20	21.5	20.5	108	103	71-125	5	30		
Carbon tetrachloride	ug/L	20	21.3	19.3	106	96	71-145	10	30		
Chlorobenzene	ug/L	20	19.6	19.2	98	96	75-125	2	30		
Chloroethane	ug/L	20	25.6	26.5	128	133	75-125	4	30	L1	
Chloroform	ug/L	20	22.3	21.1	111	106	75-125	5	30		
Chloromethane	ug/L	20	24.9	21.7	124	109	54-125	13	30		
cis-1,2-Dichloroethene	ug/L	20	23.6	22.0	118	110	75-125	7	30		
cis-1,3-Dichloropropene	ug/L	20	23.1	23.0	116	115	75-125	1	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

LABORATORY CONTROL SAMPLE & LCSD: 2623054		2623397								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.9	20.9	105	105	74-141	0	30	
Dibromomethane	ug/L	20	20.6	19.9	103	100	75-125	3	30	
Dichlorodifluoromethane	ug/L	20	20.3	19.8	101	99	59-130	2	30	
Dichlorofluoromethane	ug/L	20	24.2	24.3	121	121	75-125	0	30	
Diisopropyl ether	ug/L	20	22.0	21.3	110	106	69-125	3	30	
Ethyl-tert-butyl ether	ug/L	20	22.9	21.7	115	109	73-125	6	30	
Ethylbenzene	ug/L	20	20.9	20.2	105	101	75-125	3	30	
Hexachloro-1,3-butadiene	ug/L	20	24.4	25.3	122	126	75-131	4	30	
Isopropylbenzene (Cumene)	ug/L	20	22.7	21.5	113	107	75-125	5	30	
m&p-Xylene	ug/L	40	43.3	41.8	108	105	75-125	3	30	
Methyl-tert-butyl ether	ug/L	20	23.3	22.9	116	115	75-125	2	30	
Methylene Chloride	ug/L	20	20.5	19.0	103	95	73-125	8	30	
n-Butylbenzene	ug/L	20	23.2	22.7	116	113	75-125	2	30	
n-Propylbenzene	ug/L	20	22.2	21.5	111	107	75-125	3	30	
Naphthalene	ug/L	20	19.2	20.0	96	100	74-125	4	30	
o-Xylene	ug/L	20	21.8	21.3	109	107	75-125	2	30	
p-Isopropyltoluene	ug/L	20	23.7	22.4	118	112	75-125	6	30	
sec-Butylbenzene	ug/L	20	22.7	21.9	114	110	75-125	3	30	
Styrene	ug/L	20	20.3	19.5	101	98	75-125	4	30	
tert-Amylmethyl ether	ug/L	20	20.7	19.9	103	100	71-126	4	30	
tert-Butyl Alcohol	ug/L	200	208	199	104	100	69-131	5	30	
tert-Butylbenzene	ug/L	20	21.3	20.3	107	101	75-125	5	30	
Tetrachloroethene	ug/L	20	19.1	19.2	95	96	75-125	1	30	
Tetrahydrofuran	ug/L	200	181	181	90	90	65-127	0	30	
Toluene	ug/L	20	20.4	19.5	102	97	75-125	5	30	
trans-1,2-Dichloroethene	ug/L	20	18.8	19.3	94	97	75-125	3	30	
trans-1,3-Dichloropropene	ug/L	20	23.6	22.9	118	115	75-125	3	30	
trans-1,4-Dichloro-2-butene	ug/L	50	48.4	48.8	97	98	30-150	1	30	
Trichloroethene	ug/L	20	22.4	20.8	112	104	75-125	8	30	
Trichlorofluoromethane	ug/L	20	19.2	19.7	96	99	71-140	3	30	
Vinyl acetate	ug/L	20	21.7	21.1	109	105	68-137	3	30	
Vinyl chloride	ug/L	20	20.1	18.8	101	94	70-125	7	30	
Xylene (Total)	ug/L	60	65.1	63.2	108	105	75-125	3	30	
1,2-Dichloroethane-d4 (S)	%				117	117	75-137			
4-Bromofluorobenzene (S)	%				103	104	75-125			
Toluene-d8 (S)	%				104	108	75-125			

MATRIX SPIKE SAMPLE: 2623404		10392886005		MS		% Rec		Qualifiers	
Parameter	Units	Result	Spike Conc.	Result	% Rec	Limits			
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	27.0	135	75-137			
1,1,1-Trichloroethane	ug/L	<0.057	20	28.4	142	75-139	M1		
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	26.3	131	60-142			
1,1,2-Trichloroethane	ug/L	<0.064	20	24.6	123	75-128			
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	30.9	154	62-150	M1		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

MATRIX SPIKE SAMPLE: 2623404		10392886005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	1.2	20	31.1	150	70-129	M1
1,1-Dichloroethene	ug/L	<0.069	20	27.3	136	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	31.4	157	64-144	M1
1,2,3-Trichlorobenzene	ug/L	<0.17	20	21.5	108	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	25.0	125	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	22.7	114	65-138	
1,2,4-Trimethylbenzene	ug/L	0.083J	20	24.9	124	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	56.1	112	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	24.1	121	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	21.8	109	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	28.3	142	73-125	M1
1,2-Dichloroethene (Total)	ug/L	1.8	40	56.4	136	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	29.7	148	64-130	M1
1,3,5-Trimethylbenzene	ug/L	<0.042	20	25.2	126	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	22.7	113	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	27.2	136	67-128	M1
1,4-Dichlorobenzene	ug/L	0.30J	20	21.8	107	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	471	118	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	31.8	159	48-150	M1
2,2-Dichloropropane	ug/L	<0.096	20	29.4	147	50-150	
2-Butanone (MEK)	ug/L	2.6J	100	130	127	58-125	M1
2-Chlorotoluene	ug/L	<0.084	20	24.4	122	65-138	
2-Hexanone	ug/L	<0.19	100	141	141	61-134	M1
4-Chlorotoluene	ug/L	<0.048	20	23.8	119	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	141	141	61-130	M1
Acetone	ug/L	26.6	100	216	189	51-140	M1
Acrolein	ug/L	<2.1	200	214	107	48-150	
Acrylonitrile	ug/L	<0.49	200	257	129	55-134	
Benzene	ug/L	<0.042	20	25.9	130	63-132	
Bromobenzene	ug/L	<0.087	20	22.3	112	67-138	
Bromochloromethane	ug/L	<0.082	20	25.0	125	66-138	
Bromodichloromethane	ug/L	<0.068	20	28.5	143	75-137	M1
Bromoform	ug/L	<0.11	20	25.5	127	65-129	
Bromomethane	ug/L	<0.20	20	49.5	246	41-150	CH,M1
Carbon disulfide	ug/L	<0.20	20	28.0	140	72-132	M1
Carbon tetrachloride	ug/L	<0.079	20	28.3	141	75-150	
Chlorobenzene	ug/L	<0.066	20	23.1	116	73-127	
Chloroethane	ug/L	0.45J	20	45.1	223	74-138	MO
Chloroform	ug/L	<0.21	20	28.1	140	74-125	M1
Chloromethane	ug/L	<0.080	20	41.4	207	58-129	M1
cis-1,2-Dichloroethene	ug/L	1.8	20	30.0	141	63-135	M1
cis-1,3-Dichloropropene	ug/L	<0.069	20	28.9	145	66-129	M1
Dibromochloromethane	ug/L	<0.048	20	25.2	126	75-133	
Dibromomethane	ug/L	<0.14	20	25.9	129	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	37.2	186	72-150	M1
Dichlorofluoromethane	ug/L	2.9	20	41.3	192	75-129	M1
Diisopropyl ether	ug/L	<0.050	20	27.4	137	62-128	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

MATRIX SPIKE SAMPLE: 2623404		10392886005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	27.4	137	63-132	M1
Ethylbenzene	ug/L	<0.075	20	25.4	127	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	31.4	157	71-150	M1
Isopropylbenzene (Cumene)	ug/L	<0.064	20	26.8	134	70-136	
m&p-Xylene	ug/L	<0.11	40	51.8	129	64-142	
Methyl-tert-butyl ether	ug/L	<0.047	20	28.9	145	72-125	M1
Methylene Chloride	ug/L	<0.097	20	25.8	129	60-132	
n-Butylbenzene	ug/L	<0.16	20	27.5	138	60-150	
n-Propylbenzene	ug/L	<0.049	20	26.8	134	63-142	
Naphthalene	ug/L	0.15J	20	22.8	113	67-125	
o-Xylene	ug/L	<0.044	20	26.1	131	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	27.4	137	64-146	
sec-Butylbenzene	ug/L	<0.094	20	27.0	135	67-144	
Styrene	ug/L	<0.056	20	24.2	121	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	26.4	132	60-134	
tert-Butyl Alcohol	ug/L	<0.89	200	261	130	56-146	
tert-Butylbenzene	ug/L	<0.051	20	25.9	129	68-135	
Tetrachloroethene	ug/L	0.60	20	25.0	122	67-148	
Tetrahydrofuran	ug/L	<1.5	200	354	177	51-141	M1
Toluene	ug/L	<0.059	20	24.7	123	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	26.4	132	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	28.8	144	67-134	M1
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	63.3	127	30-150	
Trichloroethene	ug/L	0.44	20	28.0	138	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	33.9	170	75-150	M1
Vinyl acetate	ug/L	<0.12	20	28.6	143	49-143	
Vinyl chloride	ug/L	0.21	20	34.5	171	75-133	M1
Xylene (Total)	ug/L	<0.15	60	77.9	130	63-142	
1,2-Dichloroethane-d4 (S)	%				119	75-137	
4-Bromofluorobenzene (S)	%				104	75-125	
Toluene-d8 (S)	%				104	75-125	

SAMPLE DUPLICATE: 2623405

Parameter	Units	10392886006	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

SAMPLE DUPLICATE: 2623405

Parameter	Units	10392886006 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	<0.16	<0.16		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	2.3J	2.5J		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	19.7J	21.8		30	
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	<0.20	<0.20		30	
Carbon tetrachloride	ug/L	<0.079	<0.079		30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	<0.21	<0.21		30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

SAMPLE DUPLICATE: 2623405

Parameter	Units	10392886006 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	0.15J	0.14J		30	
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	<0.059	<0.059		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	119	122	2		
4-Bromofluorobenzene (S)	%	104	105	0		
Toluene-d8 (S)	%	98	98	0		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392623

QC Batch: 481638 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10392623006, 10392623007, 10392623008, 10392623009

METHOD BLANK: 2623547 Matrix: Water  
Associated Lab Samples: 10392623006, 10392623007, 10392623008, 10392623009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/26/17 14:27	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/26/17 14:27	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/26/17 14:27	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/26/17 14:27	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/26/17 14:27	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/26/17 14:27	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/26/17 14:27	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/26/17 14:27	
1,2,3-Trichlorobenzene	ug/L	<0.17	0.50	0.17	06/26/17 14:27	
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/26/17 14:27	
1,2,4-Trichlorobenzene	ug/L	<0.14	0.50	0.14	06/26/17 14:27	
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/26/17 14:27	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/26/17 14:27	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/26/17 14:27	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/26/17 14:27	
1,2-Dichloroethane	ug/L	<0.072	1.0	0.072	06/26/17 14:27	MN
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/26/17 14:27	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/26/17 14:27	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/26/17 14:27	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/26/17 14:27	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/26/17 14:27	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/26/17 14:27	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/26/17 14:27	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/26/17 14:27	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/26/17 14:27	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/26/17 14:27	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/26/17 14:27	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/26/17 14:27	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/26/17 14:27	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/26/17 14:27	
Acetone	ug/L	<0.64	20.0	0.64	06/26/17 14:27	
Acrolein	ug/L	<2.1	10.0	2.1	06/26/17 14:27	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/26/17 14:27	
Benzene	ug/L	<0.042	0.50	0.042	06/26/17 14:27	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/26/17 14:27	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/26/17 14:27	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/26/17 14:27	
Bromoform	ug/L	<0.11	4.0	0.11	06/26/17 14:27	
Bromomethane	ug/L	<0.20	4.0	0.20	06/26/17 14:27	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/26/17 14:27	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/26/17 14:27	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392623

METHOD BLANK: 2623547 Matrix: Water  
Associated Lab Samples: 10392623006, 10392623007, 10392623008, 10392623009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/26/17 14:27	
Chloroethane	ug/L	<0.12	4.0	0.12	06/26/17 14:27	MN
Chloroform	ug/L	<0.21	1.0	0.21	06/26/17 14:27	
Chloromethane	ug/L	<0.080	4.0	0.080	06/26/17 14:27	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/26/17 14:27	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/26/17 14:27	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/26/17 14:27	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/26/17 14:27	
Dichlorodifluoromethane	ug/L	<0.075	4.0	0.075	06/26/17 14:27	MN
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/26/17 14:27	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/26/17 14:27	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/26/17 14:27	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/26/17 14:27	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/26/17 14:27	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/26/17 14:27	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/26/17 14:27	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/26/17 14:27	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/26/17 14:27	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/26/17 14:27	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/26/17 14:27	
Naphthalene	ug/L	<0.064	1.0	0.064	06/26/17 14:27	
o-Xylene	ug/L	<0.044	0.50	0.044	06/26/17 14:27	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/26/17 14:27	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/26/17 14:27	
Styrene	ug/L	<0.056	0.50	0.056	06/26/17 14:27	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/26/17 14:27	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/26/17 14:27	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/26/17 14:27	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/26/17 14:27	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/26/17 14:27	
Toluene	ug/L	<0.059	0.10	0.059	06/26/17 14:27	MN
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/26/17 14:27	
trans-1,3-Dichloropropene	ug/L	<0.044	1.0	0.044	06/26/17 14:27	MN
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/26/17 14:27	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/26/17 14:27	
Trichlorofluoromethane	ug/L	<0.055	4.0	0.055	06/26/17 14:27	MN
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/26/17 14:27	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/26/17 14:27	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/26/17 14:27	
1,2-Dichloroethane-d4 (S)	%	119	75-137		06/26/17 14:27	
4-Bromofluorobenzene (S)	%	104	75-125		06/26/17 14:27	
Toluene-d8 (S)	%	102	75-125		06/26/17 14:27	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

LABORATORY CONTROL SAMPLE & LCSD: 2623548		2623549									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.8	20.2	104	101	75-136	3	30		
1,1,1-Trichloroethane	ug/L	20	21.7	21.0	109	105	75-129	3	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.7	20.8	104	104	71-138	0	30		
1,1,2-Trichloroethane	ug/L	20	20.2	19.9	101	100	75-125	1	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	22.5	21.6	113	108	69-126	4	30		
1,1-Dichloroethane	ug/L	20	22.0	22.5	110	113	75-125	2	30		
1,1-Dichloroethene	ug/L	20	20.8	20.9	104	105	75-125	0	30		
1,1-Dichloropropene	ug/L	20	22.4	23.0	112	115	75-125	3	30		
1,2,3-Trichlorobenzene	ug/L	20	18.6	19.4	93	97	75-125	4	30		
1,2,3-Trichloropropane	ug/L	20	20.1	20.0	100	100	75-125	0	30		
1,2,4-Trichlorobenzene	ug/L	20	19.4	19.5	97	97	75-125	0	30		
1,2,4-Trimethylbenzene	ug/L	20	20.7	20.3	104	101	75-125	2	30		
1,2-Dibromo-3-chloropropane	ug/L	50	44.0	45.4	88	91	71-130	3	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.2	19.8	101	99	75-125	2	30		
1,2-Dichlorobenzene	ug/L	20	18.5	18.3	93	92	75-125	1	30		
1,2-Dichloroethane	ug/L	20	22.2	23.4	111	117	70-125	5	30		
1,2-Dichloroethene (Total)	ug/L	40	40.1	39.9	100	100	75-125	1	30		
1,2-Dichloropropane	ug/L	20	22.9	21.3	114	107	75-125	7	30		
1,3,5-Trimethylbenzene	ug/L	20	21.4	20.3	107	102	75-125	5	30		
1,3-Dichlorobenzene	ug/L	20	18.9	18.9	95	94	75-125	0	30		
1,3-Dichloropropane	ug/L	20	22.0	21.2	110	106	75-125	4	30		
1,4-Dichlorobenzene	ug/L	20	17.6	18.4	88	92	75-125	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	356	384	89	96	64-140	8	30		
2,2,4-Trimethylpentane	ug/L	20	23.1	22.5	116	113	68-125	3	30		
2,2-Dichloropropane	ug/L	20	23.8	23.5	119	117	70-131	1	30		
2-Butanone (MEK)	ug/L	100	102	112	102	112	69-125	9	30		
2-Chlorotoluene	ug/L	20	19.9	19.3	99	97	75-125	3	30		
2-Hexanone	ug/L	100	116	123	116	123	73-129	6	30		
4-Chlorotoluene	ug/L	20	19.4	19.1	97	96	75-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	113	117	113	117	73-125	3	30		
Acetone	ug/L	100	144	126	144	126	66-126	13	30	CH,L1	
Acrolein	ug/L	200	223	240	112	120	56-150	7	30		
Acrylonitrile	ug/L	200	199	219	100	110	68-129	10	30		
Benzene	ug/L	20	19.2	19.5	96	98	75-125	2	30		
Bromobenzene	ug/L	20	18.2	18.3	91	92	75-125	1	30		
Bromochloromethane	ug/L	20	19.0	19.9	95	99	75-126	5	30		
Bromodichloromethane	ug/L	20	22.7	21.9	114	110	75-133	3	30		
Bromoform	ug/L	20	20.2	21.5	101	108	62-142	7	30		
Bromomethane	ug/L	20	17.8	24.6	89	123	34-143	32	30	R1	
Carbon disulfide	ug/L	20	21.8	21.6	109	108	71-125	1	30		
Carbon tetrachloride	ug/L	20	20.7	20.8	103	104	71-145	1	30		
Chlorobenzene	ug/L	20	19.4	18.6	97	93	75-125	4	30		
Chloroethane	ug/L	20	27.5	26.5	137	132	75-125	4	30	L3	
Chloroform	ug/L	20	20.2	20.5	101	103	75-125	1	30		
Chloromethane	ug/L	20	21.7	21.5	108	108	54-125	1	30		
cis-1,2-Dichloroethene	ug/L	20	22.1	21.2	110	106	75-125	4	30		
cis-1,3-Dichloropropene	ug/L	20	23.4	22.9	117	115	75-125	2	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

LABORATORY CONTROL SAMPLE & LCSD: 2623548		2623549								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	21.1	20.3	105	102	74-141	4	30	
Dibromomethane	ug/L	20	19.9	20.2	99	101	75-125	2	30	
Dichlorodifluoromethane	ug/L	20	18.9	19.3	94	96	59-130	2	30	
Dichlorofluoromethane	ug/L	20	24.8	24.5	124	123	75-125	1	30	
Diisopropyl ether	ug/L	20	20.0	21.0	100	105	69-125	5	30	
Ethyl-tert-butyl ether	ug/L	20	20.2	22.2	101	111	73-125	10	30	
Ethylbenzene	ug/L	20	20.5	19.5	102	97	75-125	5	30	
Hexachloro-1,3-butadiene	ug/L	20	24.1	25.6	120	128	75-131	6	30	
Isopropylbenzene (Cumene)	ug/L	20	22.3	21.0	112	105	75-125	6	30	
m&p-Xylene	ug/L	40	41.8	40.4	104	101	75-125	3	30	
Methyl-tert-butyl ether	ug/L	20	21.1	22.6	105	113	75-125	7	30	
Methylene Chloride	ug/L	20	18.0	19.7	90	99	73-125	9	30	
n-Butylbenzene	ug/L	20	23.4	23.1	117	116	75-125	1	30	
n-Propylbenzene	ug/L	20	21.8	21.1	109	105	75-125	4	30	
Naphthalene	ug/L	20	18.5	19.5	93	97	74-125	5	30	
o-Xylene	ug/L	20	21.3	20.5	106	103	75-125	3	30	
p-Isopropyltoluene	ug/L	20	23.4	22.6	117	113	75-125	4	30	
sec-Butylbenzene	ug/L	20	22.4	22.0	112	110	75-125	2	30	
Styrene	ug/L	20	19.5	19.2	98	96	75-125	2	30	
tert-Amylmethyl ether	ug/L	20	19.3	21.1	96	105	71-126	9	30	
tert-Butyl Alcohol	ug/L	200	193	201	96	101	69-131	4	30	
tert-Butylbenzene	ug/L	20	21.0	20.4	105	102	75-125	3	30	
Tetrachloroethene	ug/L	20	20.5	18.8	102	94	75-125	9	30	
Tetrahydrofuran	ug/L	200	237	220	119	110	65-127	7	30	
Toluene	ug/L	20	19.6	18.8	98	94	75-125	5	30	
trans-1,2-Dichloroethene	ug/L	20	18.1	18.7	90	94	75-125	4	30	
trans-1,3-Dichloropropene	ug/L	20	21.6	22.4	108	112	75-125	3	30	
trans-1,4-Dichloro-2-butene	ug/L	50	49.4	48.8	99	98	30-150	1	30	
Trichloroethene	ug/L	20	22.9	20.9	114	105	75-125	9	30	
Trichlorofluoromethane	ug/L	20	19.7	19.5	99	97	71-140	1	30	
Vinyl acetate	ug/L	20	21.0	22.0	105	110	68-137	4	30	
Vinyl chloride	ug/L	20	18.7	19.9	93	99	70-125	6	30	
Xylene (Total)	ug/L	60	63.1	61.0	105	102	75-125	3	30	
1,2-Dichloroethane-d4 (S)	%				112	120	75-137			
4-Bromofluorobenzene (S)	%				104	104	75-125			
Toluene-d8 (S)	%				105	102	75-125			

MATRIX SPIKE SAMPLE: 2623638		10392531002						
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	20	20.3	102	75-137		
1,1,1-Trichloroethane	ug/L	0.50 U	20	20.3	101	75-139		
1,1,2,2-Tetrachloroethane	ug/L	0.50 U	20	20.7	103	60-142		
1,1,2-Trichloroethane	ug/L	0.50 U	20	19.3	97	75-128		
1,1,2-Trichlorotrifluoroethane	ug/L	1.0 U	20	24.3	121	62-150		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392623

MATRIX SPIKE SAMPLE:	2623638	10392531002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	0.50 U	20	22.6	113	70-129	
1,1-Dichloroethene	ug/L	0.50 U	20	21.6	108	67-141	
1,1-Dichloropropene	ug/L	0.50 U	20	23.9	120	64-144	
1,2,3-Trichlorobenzene	ug/L	0.50 U	20	19.2	96	66-139	
1,2,3-Trichloropropane	ug/L	4.0 U	20	20.5	102	69-134	
1,2,4-Trichlorobenzene	ug/L	0.50 U	20	19.5	97	65-138	
1,2,4-Trimethylbenzene	ug/L	0.50 U	20	20.0	100	65-143	
1,2-Dibromo-3-chloropropane	ug/L	4.0 U	50	48.7	97	61-134	
1,2-Dibromoethane (EDB)	ug/L	0.50 U	20	19.0	95	74-129	
1,2-Dichlorobenzene	ug/L	0.50 U	20	17.7	89	68-135	
1,2-Dichloroethane	ug/L	1.0 U	20	21.6	108	73-125	
1,2-Dichloroethene (Total)	ug/L	1.0 U	40	38.6	96	69-134	
1,2-Dichloropropane	ug/L	4.0 U	20	21.5	108	64-130	
1,3,5-Trimethylbenzene	ug/L	0.50 U	20	20.9	105	64-146	
1,3-Dichlorobenzene	ug/L	0.50 U	20	17.9	90	69-135	
1,3-Dichloropropane	ug/L	0.50 U	20	21.0	105	67-128	
1,4-Dichlorobenzene	ug/L	0.50 U	20	17.9	89	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	200 U	400	348	87	58-140	
2,2,4-Trimethylpentane	ug/L	4.0 U	20	26.7	134	48-150	
2,2-Dichloropropane	ug/L	1.0 U	20	24.1	121	50-150	
2-Butanone (MEK)	ug/L	5.0 U	100	101	101	58-125	
2-Chlorotoluene	ug/L	0.50 U	20	19.3	97	65-138	
2-Hexanone	ug/L	5.0 U	100	123	123	61-134	
4-Chlorotoluene	ug/L	0.50 U	20	19.0	95	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	100	115	115	61-130	
Acetone	ug/L	20.0 U	100	139	139	51-140	
Acrolein	ug/L	10.0 U	200	189	94	48-150	CH
Acrylonitrile	ug/L	10.0 U	200	207	103	55-134	
Benzene	ug/L	0.50 U	20	18.8	94	63-132	
Bromobenzene	ug/L	0.50 U	20	18.1	91	67-138	
Bromochloromethane	ug/L	1.0 U	20	17.9	89	66-138	
Bromodichloromethane	ug/L	0.50 U	20	21.0	105	75-137	
Bromoform	ug/L	4.0 U	20	19.2	96	65-129	
Bromomethane	ug/L	4.0 U	20	21.8	109	41-150	
Carbon disulfide	ug/L	1.0 U	20	22.8	114	72-132	
Carbon tetrachloride	ug/L	0.50 U	20	20.1	100	75-150	
Chlorobenzene	ug/L	0.50 U	20	17.8	89	73-127	
Chloroethane	ug/L	4.0 U	20	28.8	144	74-138	MO
Chloroform	ug/L	1.0 U	20	19.7	98	74-125	
Chloromethane	ug/L	4.0 U	20	20.7	98	58-129	
cis-1,2-Dichloroethene	ug/L	0.50 U	20	20.3	102	63-135	
cis-1,3-Dichloropropene	ug/L	0.50 U	20	21.2	106	66-129	
Dibromochloromethane	ug/L	0.50 U	20	19.4	97	75-133	
Dibromomethane	ug/L	1.0 U	20	18.7	93	68-134	
Dichlorodifluoromethane	ug/L	4.0 U	20	21.2	106	72-150	
Dichlorofluoromethane	ug/L	1.0 U	20	27.3	137	75-129	M1
Diisopropyl ether	ug/L	1.0 U	20	18.9	95	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

MATRIX SPIKE SAMPLE: 2623638		10392531002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	0.50 U	20	19.8	99	63-132	
Ethylbenzene	ug/L	0.50 U	20	19.7	99	72-130	
Hexachloro-1,3-butadiene	ug/L	1.0 U	20	27.8	139	71-150	
Isopropylbenzene (Cumene)	ug/L	0.50 U	20	20.7	103	70-136	
m&p-Xylene	ug/L	1.0 U	40	40.4	101	64-142	
Methyl-tert-butyl ether	ug/L	0.50 U	20	20.3	102	72-125	
Methylene Chloride	ug/L	4.0 U	20	17.6	88	60-132	
n-Butylbenzene	ug/L	0.50 U	20	22.9	115	60-150	
n-Propylbenzene	ug/L	0.50 U	20	21.7	109	63-142	
Naphthalene	ug/L	1.0 U	20	18.9	94	67-125	
o-Xylene	ug/L	0.50 U	20	20.2	101	60-143	
p-Isopropyltoluene	ug/L	0.50 U	20	22.2	111	64-146	
sec-Butylbenzene	ug/L	0.50 U	20	22.0	110	67-144	
Styrene	ug/L	0.50 U	20	18.2	91	67-136	
tert-Amylmethyl ether	ug/L	0.50 U	20	17.9	90	60-134	
tert-Butyl Alcohol	ug/L	10.0 U	200	190	95	56-146	
tert-Butylbenzene	ug/L	0.50 U	20	20.7	103	68-135	
Tetrachloroethene	ug/L	0.50 U	20	19.5	98	67-148	
Tetrahydrofuran	ug/L	10.0 U	200	269	135	51-141	
Toluene	ug/L	0.10 U	20	19.0	95	61-140	
trans-1,2-Dichloroethene	ug/L	0.50 U	20	18.3	91	62-138	
trans-1,3-Dichloropropene	ug/L	1.0 U	20	21.1	106	67-134	
trans-1,4-Dichloro-2-butene	ug/L	10.0 U	50	47.9	96	30-150	
Trichloroethene	ug/L	0.40 U	20	21.4	107	64-149	
Trichlorofluoromethane	ug/L	4.0 U	20	26.5	132	75-150	
Vinyl acetate	ug/L	10.0 U	20	21.9	110	49-143	
Vinyl chloride	ug/L	0.20 U	20	22.5	112	75-133	
Xylene (Total)	ug/L	1.5 U	60	60.6	101	63-142	
1,2-Dichloroethane-d4 (S)	%				112	75-137	
4-Bromofluorobenzene (S)	%				110	75-125	
Toluene-d8 (S)	%				107	75-125	

SAMPLE DUPLICATE: 2623637

Parameter	Units	10392531001	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	<0.064		30	
1,1,1-Trichloroethane	ug/L	0.50 U	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	0.50 U	<0.055		30	
1,1,2-Trichloroethane	ug/L	0.50 U	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	1.0 U	<0.13		30	
1,1-Dichloroethane	ug/L	0.81	0.75	8	30	
1,1-Dichloroethene	ug/L	0.50 U	<0.069		30	
1,1-Dichloropropene	ug/L	0.50 U	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	0.50 U	<0.17		30	
1,2,3-Trichloropropane	ug/L	4.0 U	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

SAMPLE DUPLICATE: 2623637

Parameter	Units	10392531001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	0.50 U	<0.14			30
1,2,4-Trimethylbenzene	ug/L	0.50 U	<0.068			30
1,2-Dibromo-3-chloropropane	ug/L	4.0 U	<0.60			30
1,2-Dibromoethane (EDB)	ug/L	0.50 U	<0.092			30
1,2-Dichlorobenzene	ug/L	0.50 U	<0.078			30
1,2-Dichloroethane	ug/L	1.0 U	<0.072			30
1,2-Dichloroethene (Total)	ug/L	3.5	3.3	5		30
1,2-Dichloropropane	ug/L	4.0 U	<0.066			30
1,3,5-Trimethylbenzene	ug/L	0.50 U	<0.042			30
1,3-Dichlorobenzene	ug/L	0.50 U	<0.085			30
1,3-Dichloropropane	ug/L	0.50 U	<0.059			30
1,4-Dichlorobenzene	ug/L	0.50 U	0.35J			30
1,4-Dioxane (p-Dioxane)	ug/L	200 U	<4.8			30
2,2,4-Trimethylpentane	ug/L	4.0 U	<0.087			30
2,2-Dichloropropane	ug/L	1.0 U	<0.096			30
2-Butanone (MEK)	ug/L	5.0 U	<1.1			30
2-Chlorotoluene	ug/L	0.50 U	<0.084			30
2-Hexanone	ug/L	5.0 U	<0.19			30
4-Chlorotoluene	ug/L	0.50 U	<0.048			30
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	<0.80			30
Acetone	ug/L	20.0 U	<0.64			30
Acrolein	ug/L	10.0 U	<2.1			30
Acrylonitrile	ug/L	10.0 U	<0.49			30
Benzene	ug/L	0.50 U	0.059J			30
Bromobenzene	ug/L	0.50 U	<0.087			30
Bromochloromethane	ug/L	1.0 U	<0.082			30
Bromodichloromethane	ug/L	0.50 U	<0.068			30
Bromoform	ug/L	4.0 U	<0.11			30
Bromomethane	ug/L	4.0 U	<0.20			30
Carbon disulfide	ug/L	1.0 U	<0.20			30
Carbon tetrachloride	ug/L	0.50 U	<0.079			30
Chlorobenzene	ug/L	0.50 U	0.26J			30
Chloroethane	ug/L	4.0 U	<0.12			30
Chloroform	ug/L	1.0 U	<0.21			30
Chloromethane	ug/L	4.0 U	<0.080			30
cis-1,2-Dichloroethene	ug/L	3.5	3.3	5		30
cis-1,3-Dichloropropene	ug/L	0.50 U	<0.069			30
Dibromochloromethane	ug/L	0.50 U	<0.048			30
Dibromomethane	ug/L	1.0 U	<0.14			30
Dichlorodifluoromethane	ug/L	4.0 U	0.77J			30
Dichlorofluoromethane	ug/L	1.6	1.5	4		30
Diisopropyl ether	ug/L	1.0 U	<0.050			30
Ethyl-tert-butyl ether	ug/L	0.50 U	<0.062			30
Ethylbenzene	ug/L	0.50 U	<0.075			30
Hexachloro-1,3-butadiene	ug/L	1.0 U	<0.13			30
Isopropylbenzene (Cumene)	ug/L	0.50 U	<0.064			30
m&p-Xylene	ug/L	1.0 U	<0.11			30

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

SAMPLE DUPLICATE: 2623637

Parameter	Units	10392531001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	0.50 U	<0.047		30	
Methylene Chloride	ug/L	4.0 U	<0.097		30	
n-Butylbenzene	ug/L	0.50 U	<0.16		30	
n-Propylbenzene	ug/L	0.50 U	<0.049		30	
Naphthalene	ug/L	1.0 U	<0.064		30	
o-Xylene	ug/L	0.50 U	<0.044		30	
p-Isopropyltoluene	ug/L	0.50 U	<0.064		30	
sec-Butylbenzene	ug/L	0.50 U	<0.094		30	
Styrene	ug/L	0.50 U	<0.056		30	
tert-Amylmethyl ether	ug/L	0.50 U	<0.073		30	
tert-Butyl Alcohol	ug/L	10.0 U	<0.89		30	
tert-Butylbenzene	ug/L	0.50 U	<0.051		30	
Tetrachloroethene	ug/L	0.77	0.83	8	30	
Tetrahydrofuran	ug/L	10.0 U	<1.5		30	
Toluene	ug/L	0.10 U	<0.059		30	
trans-1,2-Dichloroethene	ug/L	0.50 U	<0.15		30	
trans-1,3-Dichloropropene	ug/L	1.0 U	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	10.0 U	<0.45		30	
Trichloroethene	ug/L	2.0	2.0	3	30	
Trichlorofluoromethane	ug/L	4.0 U	<0.055		30	
Vinyl acetate	ug/L	10.0 U	<0.12		30	
Vinyl chloride	ug/L	0.20 U	0.20		30	
Xylene (Total)	ug/L	1.5 U	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	115	117	2		
4-Bromofluorobenzene (S)	%	104	104	0		
Toluene-d8 (S)	%	100	101	0		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10392623

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 481483

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 481638

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.  
CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.  
HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).  
L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.  
R1 RPD value was outside control limits.

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10392623

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10392623001	WS5-Eff-GW-061417	EPA 8260B	481483		
10392623002	WS5-Inf-GW-061417	EPA 8260B	481483		
10392623003	MW17D-GW-061417	EPA 8260B	481483		
10392623004	W20-GW-061417	EPA 8260B	481483		
10392623005	TB-061417	EPA 8260B	481483		
10392623006	MW06D-GW-061517	EPA 8260B	481638		
10392623007	MW19D-GW-061517	EPA 8260B	481638		
10392623008	W26-GW-061517	EPA 8260B	481638		
10392623009	TB-061517	EPA 8260B	481638		

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**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M Hill **Project #:** \_\_\_\_\_

**WO# : 10392623**



**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

**Tracking Number:** \_\_\_\_\_

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ **Temp Blank?**  Yes  No

**Thermometer**  151401163  151401164 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Used:**  151401164 **Cooler Temp Read (°C):** 2.63.6 **Cooler Temp Corrected (°C):** 2.73.7 **Biological Tissue Frozen? -**  Yes  No  NA

**Temp should be above freezing to 6°C** **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** RGG/17/17

**USDA Regulated Soil** ( N/A, water sample) **Did samples originate in a quarantine zone within the United States:** AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No **Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?**  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>RSK Needs headspace RGG/17/17</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

**Field Data Required?**  Yes  No

**Person Contacted:** \_\_\_\_\_ **Date/Time:** \_\_\_\_\_

**Comments/Resolution:** \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>12:22</u>	Temp: <u>2.63.6</u>	Corrected Temp: <u>2.73.7</u>
Time: <u>12:39</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** \_\_\_\_\_

JENNI GROSS

**Date:** 06/19/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 30, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

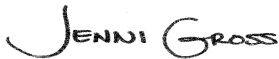
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10393159001	Reed-GW-062017	Water	06/20/17 13:15	06/22/17 09:45

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393159001	Reed-GW-062017	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393159001</b>	<b>Reed-GW-062017</b>					
RSK 175	Methane	2.0J	ug/L	10.0	06/27/17 11:31	
6010C Met	Barium, Dissolved	45.0	ug/L	10.0	06/27/17 14:01	
6010C Met	Calcium, Dissolved	26400	ug/L	500	06/27/17 14:01	
6010C Met	Cobalt, Dissolved	0.83J	ug/L	10.0	06/27/17 14:01	
6010C Met	Copper, Dissolved	3.0J	ug/L	10.0	06/27/17 14:01	
6010C Met	Magnesium, Dissolved	10400	ug/L	500	06/27/17 14:01	
6010C Met	Manganese, Dissolved	0.96J	ug/L	5.0	06/27/17 14:01	
6010C Met	Potassium, Dissolved	3090	ug/L	2500	06/27/17 14:01	
6010C Met	Sodium, Dissolved	13200	ug/L	1000	06/27/17 14:01	
6010C Met	Vanadium, Dissolved	24.0	ug/L	15.0	06/27/17 14:01	
6010C Met	Zinc, Dissolved	37.3	ug/L	20.0	06/27/17 14:01	
SM 2320B	Alkalinity, Total as CaCO3	144	mg/L	5.0	06/23/17 14:54	
SM 2540C	Total Dissolved Solids	204	mg/L	10.8	06/26/17 11:43	
EPA 300.0	Chloride	1.4	mg/L	1.2	06/22/17 13:26	
EPA 300.0	Nitrate as N	0.24	mg/L	0.10	06/22/17 13:26	H1
EPA 300.0	Sulfate	6.6	mg/L	1.2	06/22/17 13:26	
EPA 353.2	Nitrogen, NO2 plus NO3	0.26	mg/L	0.020	06/29/17 12:11	
SM 5310C	Total Organic Carbon	1.5	mg/L	1.0	06/28/17 18:10	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481338

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392504001,10392621002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2621750)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- Reed-GW-062017 (Lab ID: 10393159001)

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481174

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10392956002, 10393251001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2621118)
  - Sulfate
- MSD (Lab ID: 2621119)
  - Sulfate

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 482462

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2627870)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2627871)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** June 30, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

**Sample: Reed-GW-062017**      **Lab ID: 10393159001**      Collected: 06/20/17 13:15      Received: 06/22/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/27/17 11:31	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/27/17 11:31	74-85-1	
Methane	2.0J	ug/L	10.0	1.1	1		06/27/17 11:31	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<13.5	ug/L	200	13.5	1	06/23/17 09:40	06/27/17 14:01	7429-90-5	
Antimony, Dissolved	<2.5	ug/L	20.0	2.5	1	06/23/17 09:40	06/27/17 14:01	7440-36-0	
Arsenic, Dissolved	<2.5	ug/L	20.0	2.5	1	06/23/17 09:40	06/27/17 14:01	7440-38-2	
Barium, Dissolved	45.0	ug/L	10.0	0.20	1	06/23/17 09:40	06/27/17 14:01	7440-39-3	
Beryllium, Dissolved	<0.064	ug/L	5.0	0.064	1	06/23/17 09:40	06/27/17 14:01	7440-41-7	
Cadmium, Dissolved	<0.30	ug/L	3.0	0.30	1	06/23/17 09:40	06/27/17 14:01	7440-43-9	
Calcium, Dissolved	26400	ug/L	500	15.8	1	06/23/17 09:40	06/27/17 14:01	7440-70-2	
Chromium, Dissolved	<2.0	ug/L	10.0	2.0	1	06/23/17 09:40	06/27/17 14:01	7440-47-3	
Cobalt, Dissolved	0.83J	ug/L	10.0	0.51	1	06/23/17 09:40	06/27/17 14:01	7440-48-4	
Copper, Dissolved	3.0J	ug/L	10.0	0.89	1	06/23/17 09:40	06/27/17 14:01	7440-50-8	
Iron, Dissolved	<18.0	ug/L	50.0	18.0	1	06/23/17 09:40	06/27/17 14:01	7439-89-6	
Lead, Dissolved	<1.9	ug/L	10.0	1.9	1	06/23/17 09:40	06/27/17 14:01	7439-92-1	
Magnesium, Dissolved	10400	ug/L	500	7.4	1	06/23/17 09:40	06/27/17 14:01	7439-95-4	
Manganese, Dissolved	0.96J	ug/L	5.0	0.33	1	06/23/17 09:40	06/27/17 14:01	7439-96-5	
Nickel, Dissolved	<1.6	ug/L	20.0	1.6	1	06/23/17 09:40	06/27/17 14:01	7440-02-0	
Potassium, Dissolved	3090	ug/L	2500	26.1	1	06/23/17 09:40	06/27/17 14:01	7440-09-7	
Selenium, Dissolved	<4.5	ug/L	20.0	4.5	1	06/23/17 09:40	06/27/17 14:01	7782-49-2	
Silver, Dissolved	<0.28	ug/L	10.0	0.28	1	06/23/17 09:40	06/27/17 14:01	7440-22-4	
Sodium, Dissolved	13200	ug/L	1000	12.0	1	06/23/17 09:40	06/27/17 14:01	7440-23-5	
Thallium, Dissolved	<3.8	ug/L	20.0	3.8	1	06/23/17 09:40	06/27/17 14:01	7440-28-0	
Vanadium, Dissolved	24.0	ug/L	15.0	0.39	1	06/23/17 09:40	06/27/17 14:01	7440-62-2	
Zinc, Dissolved	37.3	ug/L	20.0	1.4	1	06/23/17 09:40	06/27/17 14:01	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	06/23/17 08:16	06/25/17 20:16	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	144	mg/L	5.0	1.4	1		06/23/17 14:54		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	204	mg/L	10.8	5.4	1		06/26/17 11:43		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/27/17 17:21	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.4	mg/L	1.2	0.10	1		06/22/17 13:26	16887-00-6	
Nitrate as N	0.24	mg/L	0.10	0.013	1		06/22/17 13:26	14797-55-8	H1
Sulfate	6.6	mg/L	1.2	0.16	1		06/22/17 13:26	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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**Sample: Reed-GW-062017**      **Lab ID: 10393159001**      Collected: 06/20/17 13:15      Received: 06/22/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>0.26</b>	mg/L	0.020	0.0075	1		06/29/17 12:11		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	06/23/17 08:39	06/23/17 13:39		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>1.5</b>	mg/L	1.0	0.20	1		06/28/17 18:10	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 481489 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10393159001

METHOD BLANK: 2623055 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/27/17 10:19	
Ethene	ug/L	<0.68	10.0	0.68	06/27/17 10:19	
Methane	ug/L	1.6J	10.0	1.1	06/27/17 10:19	

LABORATORY CONTROL SAMPLE & LCSD: 2623056

Parameter	Units	2623057		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result						
Ethane	ug/L	114	110	97	96	85-115	1	20	
Ethene	ug/L	106	103	97	96	85-115	1	20	
Methane	ug/L	60.7	59.4	98	97	85-115	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2625742

Parameter	Units	60246932005		2625743		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Ethane	ug/L	ND	114	83.4	106	73	92	30-150	23	20	R1
Ethene	ug/L	ND	106	79.6	99.3	74	93	30-150	22	20	R1
Methane	ug/L	20300	60.7	695	1090	-32400	-31700	30-150	44	20	M1,R1

SAMPLE DUPLICATE: 2624616

Parameter	Units	60246932002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	26200	23800	10	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 481301 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10393159001

METHOD BLANK: 2621658 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	06/25/17 19:57	

LABORATORY CONTROL SAMPLE: 2621659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.6	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621660 2621661

Parameter	Units	10392580002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Mercury, Dissolved	ug/L	ND	5	5	4.7	4.8	94	95	80-120	2	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 481298 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10393159001

METHOD BLANK: 2621646 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<13.5	200	13.5	06/27/17 13:56	
Antimony, Dissolved	ug/L	<2.5	20.0	2.5	06/27/17 13:56	
Arsenic, Dissolved	ug/L	<2.5	20.0	2.5	06/27/17 13:56	
Barium, Dissolved	ug/L	<0.20	10.0	0.20	06/27/17 13:56	
Beryllium, Dissolved	ug/L	<0.064	5.0	0.064	06/27/17 13:56	
Cadmium, Dissolved	ug/L	<0.30	3.0	0.30	06/27/17 13:56	
Calcium, Dissolved	ug/L	<15.8	500	15.8	06/27/17 13:56	
Chromium, Dissolved	ug/L	<2.0	10.0	2.0	06/27/17 13:56	
Cobalt, Dissolved	ug/L	<0.51	10.0	0.51	06/27/17 13:56	
Copper, Dissolved	ug/L	<0.89	10.0	0.89	06/27/17 13:56	
Iron, Dissolved	ug/L	<18.0	50.0	18.0	06/27/17 13:56	
Lead, Dissolved	ug/L	<1.9	10.0	1.9	06/27/17 13:56	
Magnesium, Dissolved	ug/L	<7.4	500	7.4	06/27/17 13:56	
Manganese, Dissolved	ug/L	<0.33	5.0	0.33	06/27/17 13:56	
Nickel, Dissolved	ug/L	<1.6	20.0	1.6	06/27/17 13:56	
Potassium, Dissolved	ug/L	<26.1	2500	26.1	06/27/17 13:56	
Selenium, Dissolved	ug/L	<4.5	20.0	4.5	06/27/17 13:56	
Silver, Dissolved	ug/L	<0.28	10.0	0.28	06/27/17 13:56	
Sodium, Dissolved	ug/L	<12.0	1000	12.0	06/27/17 13:56	
Thallium, Dissolved	ug/L	<3.8	20.0	3.8	06/27/17 13:56	
Vanadium, Dissolved	ug/L	<0.39	15.0	0.39	06/27/17 13:56	
Zinc, Dissolved	ug/L	<1.4	20.0	1.4	06/27/17 13:56	

LABORATORY CONTROL SAMPLE: 2621647

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20800	104	80-120	
Antimony, Dissolved	ug/L	1000	1010	101	80-120	
Arsenic, Dissolved	ug/L	1000	1030	103	80-120	
Barium, Dissolved	ug/L	1000	1000	100	80-120	
Beryllium, Dissolved	ug/L	1000	1030	103	80-120	
Cadmium, Dissolved	ug/L	1000	1010	101	80-120	
Calcium, Dissolved	ug/L	20000	19300	97	80-120	
Chromium, Dissolved	ug/L	1000	996	100	80-120	
Cobalt, Dissolved	ug/L	1000	992	99	80-120	
Copper, Dissolved	ug/L	1000	981	98	80-120	
Iron, Dissolved	ug/L	20000	20000	100	80-120	
Lead, Dissolved	ug/L	1000	1010	101	80-120	
Magnesium, Dissolved	ug/L	20000	19900	100	80-120	
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

LABORATORY CONTROL SAMPLE: 2621647

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1000	100	80-120	
Potassium, Dissolved	ug/L	20000	19700	98	80-120	
Selenium, Dissolved	ug/L	1000	1070	107	80-120	
Silver, Dissolved	ug/L	500	499	100	80-120	
Sodium, Dissolved	ug/L	20000	19700	99	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	964	96	80-120	
Zinc, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621648 2621649

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10393159001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	<13.5	20000	20000	20800	21000	104	105	75-125	1	20
Antimony, Dissolved	ug/L	<2.5	1000	1000	1000	1010	100	101	75-125	1	20
Arsenic, Dissolved	ug/L	<2.5	1000	1000	1020	1030	102	103	75-125	1	20
Barium, Dissolved	ug/L	45.0	1000	1000	1040	1050	99	101	75-125	1	20
Beryllium, Dissolved	ug/L	<0.064	1000	1000	1020	1040	102	104	75-125	1	20
Cadmium, Dissolved	ug/L	<0.30	1000	1000	999	1010	100	101	75-125	1	20
Calcium, Dissolved	ug/L	26400	20000	20000	46100	46700	98	101	75-125	1	20
Chromium, Dissolved	ug/L	<2.0	1000	1000	985	998	99	100	75-125	1	20
Cobalt, Dissolved	ug/L	0.83J	1000	1000	971	985	97	98	75-125	1	20
Copper, Dissolved	ug/L	3.0J	1000	1000	980	993	98	99	75-125	1	20
Iron, Dissolved	ug/L	<18.0	20000	20000	19700	20000	99	100	75-125	1	20
Lead, Dissolved	ug/L	<1.9	1000	1000	989	1000	99	100	75-125	1	20
Magnesium, Dissolved	ug/L	10400	20000	20000	30500	30900	101	103	75-125	1	20
Manganese, Dissolved	ug/L	0.96J	1000	1000	994	1010	99	101	75-125	1	20
Nickel, Dissolved	ug/L	<1.6	1000	1000	976	988	98	99	75-125	1	20
Potassium, Dissolved	ug/L	3090	20000	20000	23300	23600	101	103	75-125	2	20
Selenium, Dissolved	ug/L	<4.5	1000	1000	1050	1060	105	106	75-125	1	20
Silver, Dissolved	ug/L	<0.28	500	500	494	501	99	100	75-125	1	20
Sodium, Dissolved	ug/L	13200	20000	20000	33200	33600	100	102	75-125	1	20
Thallium, Dissolved	ug/L	<3.8	1000	1000	992	1020	99	102	75-125	3	20
Vanadium, Dissolved	ug/L	24.0	1000	1000	979	991	95	97	75-125	1	20
Zinc, Dissolved	ug/L	37.3	1000	1000	1010	1020	98	99	75-125	1	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 481338 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10393159001

METHOD BLANK: 2621745 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/23/17 10:29	

LABORATORY CONTROL SAMPLE & LCSD: 2621746 2621747

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	42.2	43.4	105	108	90-110	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621748 2621749

Parameter	Units	10392504001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	337	40	40	379	379	107	106	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621750 2621751

Parameter	Units	10392621002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	179	40	40	209	211	74	80	80-120	1	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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QC Batch:	481558	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	10393159001		

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METHOD BLANK: 2623251 Matrix: Water

Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/26/17 11:43	

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LABORATORY CONTROL SAMPLE: 2623252

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	970	97	80-120	

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SAMPLE DUPLICATE: 2623253

Parameter	Units	10392876002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	635	638	0	10	

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SAMPLE DUPLICATE: 2623254

Parameter	Units	10392820001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1620	1610	0	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 83510 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10393159001

METHOD BLANK: 355730 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/27/17 17:21	

LABORATORY CONTROL SAMPLE: 355731

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	97	90-110	

MATRIX SPIKE SAMPLE: 355736

Parameter	Units	2056680005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.090	42	75-125	

SAMPLE DUPLICATE: 355735

Parameter	Units	2056680005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	0.0054J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 481174 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10393159001

METHOD BLANK: 2620688 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/22/17 13:41	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/22/17 13:41	
Sulfate	mg/L	<0.16	1.2	0.16	06/22/17 13:41	

LABORATORY CONTROL SAMPLE: 2620689

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.8	102	90-110	
Nitrate as N	mg/L	1	0.98	98	90-110	
Sulfate	mg/L	12.5	12.7	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2620690 2620691

Parameter	Units	10392956002		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
Chloride	mg/L	<0.10	12.5	12.5	12.5	12.7	12.7	102	102	90-110	0	20	
Nitrate as N	mg/L	<0.013	1	1	1	0.97	0.97	97	97	90-110	0	20	
Sulfate	mg/L	<0.16	12.5	12.5	12.5	13.3	13.0	107	104	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2621118 2621119

Parameter	Units	10393251001		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
Chloride	mg/L	8.4	12.5	12.5	12.5	20.1	20.2	94	95	90-110	0	20	
Nitrate as N	mg/L	<0.013	1	1	1	0.97	0.97	97	97	90-110	0	20	
Sulfate	mg/L	887	250	250	250	1090	1080	81	78	90-110	1	20 M6	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

QC Batch: 482462

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10393159001

METHOD BLANK: 2627866

Matrix: Water

Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/29/17 12:41	FS

LABORATORY CONTROL SAMPLE: 2627867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.94	94	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627868 2627869

Parameter	Units	10393443001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	0.84	1	1	1.8	1.8	96	99	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627870 2627871

Parameter	Units	10393443002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	1.4	1	1	2.3	2.3	91	92	90-110	0	20	E

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393159

QC Batch: 117749 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10393159001

METHOD BLANK: 465830 Matrix: Water  
Associated Lab Samples: 10393159001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	06/28/17 13:29	

LABORATORY CONTROL SAMPLE: 465831

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 465832 465833

Parameter	Units	10393098001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Total Organic Carbon	mg/L	5.9	25	25	31.5	31.9	102	104	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 465834 465835

Parameter	Units	10393355001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Total Organic Carbon	mg/L	1.1J	25	25	25.6	25.9	98	99	80-120	1	20	

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393159

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10393159001	Reed-GW-062017	RSK 175	481489		
10393159001	Reed-GW-062017	EPA 3010	481298	6010C Met	481378
10393159001	Reed-GW-062017	EPA 7470A	481301	EPA 7470A	481505
10393159001	Reed-GW-062017	SM 2320B	481338		
10393159001	Reed-GW-062017	SM 2540C	481558		
10393159001	Reed-GW-062017	SM 4500-S-2 D	83510		
10393159001	Reed-GW-062017	EPA 300.0	481174		
10393159001	Reed-GW-062017	EPA 353.2	482462		
10393159001	Reed-GW-062017	EPA 410.4	481318	EPA 410.4	481419
10393159001	Reed-GW-062017	SM 5310C	117749		

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## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10393159

### Section A

### Section B

### Section C

Required Client Information:

Required Project Information:

Invoice Information:

Page: 1 of 1

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Theriault
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Fax:	Project Name: UPRR Freeman	Pace Project Manager: Jennifer Gross
Requested Due Date: <b>10 Day Standard</b>	Project #: 1497	Pace Profile #: 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test	Y/N	Requested Analysis Filtered (Y/N)																		
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Low Level VOCs by 8260				6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK176	COD 410.4	BOD 10360WLL	Nitrate-Nitrite 353.2	CSIA of CTET (8260 Analysis Required)							
1	Reed-GW-062017				WTG			6/20/17	1315	10		X	X	X	X		X	X	X	X	X	X	X																001
2																																							
3																																							
4																																							
5																																							
6																																							
7																																							
8																																							
9																																							
10																																							
11																																							
12																																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	ZLB/CH2M	6-21-17	1443	Handwritten Signature	6/21/17	1445	4.6	Y	Y	Y
*Field filtered by client										

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: LK Baumann	SIGNATURE of SAMPLER: <i>LK Baumann</i>					
DATE Signed: 6-21-17						

**Sample Condition Upon Receipt - ESI Tech Specs** Client Name: **CH2M Hill** Project #: **WO# : 10393159**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other:

Tracking Number: **7021 4575 3735**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Temp Blank?  Yes  No  
 Thermometer  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Used:  151401163  151401164  
 Cooler Temp Read (°C): **4.5** Cooler Temp Corrected (°C): **4.6** Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: **1.01** Date and Initials of Person Examining Contents: **ME 6-22-17**  
 USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

			COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input type="checkbox"/> No		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>ME 6-22-17</b>	10. <b>BP2U fell during transfer</b>
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>wt</b>	12.
-Includes Date/Time/ID/Analysis Matrix:			
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Sample # <b>1 1/1 1/1 1/1</b>
Exceptions: VOA, Coliform, TOC/BOD, Oil and Grease, DRO/8015 (water) and Dioxin	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Initial when completed: Lot # of added preservative:
Per method, VOA pH is checked after analysis			
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: **David Hodson** Date/Time: **06/22/17**

Comments/Resolution: **Proceed with limited volume on 300.0, TDS and Alk - due to sample receiving accident.**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <b>1000</b> Temp: <b>4.5</b> Corrected Temp: <b>4.6</b>	
Time: put in cooler	
Time: <b>1012</b> Temp: Corrected Temp:	

**Project Manager Review:** **JENNI GROSS** Date: **06/22/17**  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

WO#: 2056646



2056646

tical<sup>®</sup>  
abs.com

Workorder: 10393159

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date:

6/22/2017

Results Requested By:

7/7/2017

Report To		Subcontract To					Requested Analysis																							
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 sulfide																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers											LAB USE ONLY													
1	Reed-GW-062017	PS	6/20/2017 13:15	10393159001	Water	Other																								
2																														
3																														
4																														

Transfers						Comments									
Released By	Date/Time	Received By	Date/Time												
<i>Alanna O'Connell</i>	Pace MN 6/22/17 1330	<i>FedEx</i>													
<i>FedEx</i>	6-23-17 930	<i>J Pace</i>	6-23-17 930												

Cooler Temperature on Receipt 20 °C      Custody Seal Y or N      Received on Ice Y or N      Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend, Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon R

Proj

# WO#: 2056646

PM: CMM

Due Date: 07/07/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 6/23/17 tmb

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8 <u>500 Plastic preserved</u>
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13 If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





Client Name: Pace MN

Project #: **WO#: 1290194**

PM: HRZ Due Date: 07/06/17  
CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.5 Cooler Temp Corrected °C: 1.8 Biological Tissue Frozen?  Yes  No  N/A  
Temp should be above freezing to 6°C Correction Factor: 1.2 Date and Initials of Person Examining Contents: JDC 6/22/17

Comments: MS 6-23-17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: \_\_\_\_\_

Date: 6.23.17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

June 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

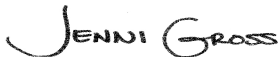
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393161

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10393161001	Reed-GW-062017	Water	06/20/17 13:15	06/22/17 09:45
10393161002	TRIP BLANK-062017	Water	06/20/17 07:00	06/22/17 09:45

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393161001	Reed-GW-062017	EPA 8260B	DJB	83	PASI-M
10393161002	TRIP BLANK-062017	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393161001</b>	<b>Reed-GW-062017</b>					
EPA 8260B	Acetone	12.7J	ug/L	20.0	06/27/17 19:24	L1

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** June 28, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 481810

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2624557)
- Acetone

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481810

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

**Sample: Reed-GW-062017**      **Lab ID: 10393161001**      Collected: 06/20/17 13:15      Received: 06/22/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/27/17 19:24	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/27/17 19:24	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/27/17 19:24	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/27/17 19:24	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/27/17 19:24	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/27/17 19:24	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/27/17 19:24	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/27/17 19:24	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/27/17 19:24	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/27/17 19:24	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/27/17 19:24	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/27/17 19:24	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/27/17 19:24	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/27/17 19:24	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/27/17 19:24	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/27/17 19:24	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/27/17 19:24	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/27/17 19:24	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/27/17 19:24	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/27/17 19:24	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/27/17 19:24	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/27/17 19:24	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/27/17 19:24	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/27/17 19:24	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/27/17 19:24	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/27/17 19:24	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/27/17 19:24	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/27/17 19:24	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/27/17 19:24	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/27/17 19:24	108-10-1	
Acetone	12.7J	ug/L	20.0	0.64	1		06/27/17 19:24	67-64-1	L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/27/17 19:24	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/27/17 19:24	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/27/17 19:24	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/27/17 19:24	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/27/17 19:24	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/27/17 19:24	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/27/17 19:24	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/27/17 19:24	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/27/17 19:24	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/27/17 19:24	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/27/17 19:24	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/27/17 19:24	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/27/17 19:24	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/27/17 19:24	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/27/17 19:24	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

**Sample: Reed-GW-062017**      **Lab ID: 10393161001**      Collected: 06/20/17 13:15      Received: 06/22/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/27/17 19:24	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/27/17 19:24	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/27/17 19:24	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/27/17 19:24	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/27/17 19:24	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/27/17 19:24	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/27/17 19:24	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/27/17 19:24	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/27/17 19:24	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/27/17 19:24	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/27/17 19:24	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/27/17 19:24	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/27/17 19:24	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/27/17 19:24	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/27/17 19:24	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/27/17 19:24	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/27/17 19:24	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/27/17 19:24	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/27/17 19:24	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/27/17 19:24	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/27/17 19:24	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/27/17 19:24	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/27/17 19:24	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/27/17 19:24	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/27/17 19:24	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/27/17 19:24	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/27/17 19:24	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/27/17 19:24	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/27/17 19:24	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/27/17 19:24	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/27/17 19:24	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/27/17 19:24	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/27/17 19:24	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/27/17 19:24	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		06/27/17 19:24	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		06/27/17 19:24	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/27/17 19:24	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

Sample: TRIP BLANK-062017 Lab ID: 10393161002 Collected: 06/20/17 07:00 Received: 06/22/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/27/17 12:51	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/27/17 12:51	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/27/17 12:51	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/27/17 12:51	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/27/17 12:51	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/27/17 12:51	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/27/17 12:51	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/27/17 12:51	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/27/17 12:51	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/27/17 12:51	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/27/17 12:51	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/27/17 12:51	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/27/17 12:51	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/27/17 12:51	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/27/17 12:51	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/27/17 12:51	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/27/17 12:51	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/27/17 12:51	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/27/17 12:51	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/27/17 12:51	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/27/17 12:51	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/27/17 12:51	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/27/17 12:51	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/27/17 12:51	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/27/17 12:51	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/27/17 12:51	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/27/17 12:51	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/27/17 12:51	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/27/17 12:51	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/27/17 12:51	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		06/27/17 12:51	67-64-1	L3
Acrolein	<2.1	ug/L	10.0	2.1	1		06/27/17 12:51	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/27/17 12:51	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/27/17 12:51	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/27/17 12:51	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/27/17 12:51	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/27/17 12:51	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/27/17 12:51	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/27/17 12:51	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/27/17 12:51	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/27/17 12:51	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/27/17 12:51	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/27/17 12:51	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/27/17 12:51	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/27/17 12:51	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/27/17 12:51	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

**Sample: TRIP BLANK-062017**      **Lab ID: 10393161002**      Collected: 06/20/17 07:00      Received: 06/22/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/27/17 12:51	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/27/17 12:51	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/27/17 12:51	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/27/17 12:51	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/27/17 12:51	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/27/17 12:51	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/27/17 12:51	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/27/17 12:51	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/27/17 12:51	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/27/17 12:51	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/27/17 12:51	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/27/17 12:51	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/27/17 12:51	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/27/17 12:51	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/27/17 12:51	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/27/17 12:51	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/27/17 12:51	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/27/17 12:51	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/27/17 12:51	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/27/17 12:51	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/27/17 12:51	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/27/17 12:51	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/27/17 12:51	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/27/17 12:51	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/27/17 12:51	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/27/17 12:51	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/27/17 12:51	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/27/17 12:51	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/27/17 12:51	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/27/17 12:51	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/27/17 12:51	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/27/17 12:51	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/27/17 12:51	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/27/17 12:51	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		06/27/17 12:51	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		06/27/17 12:51	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		06/27/17 12:51	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393161

QC Batch: 481810 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10393161001, 10393161002

METHOD BLANK: 2624556 Matrix: Water  
Associated Lab Samples: 10393161001, 10393161002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/27/17 11:24	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/27/17 11:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/27/17 11:24	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/27/17 11:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/27/17 11:24	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/27/17 11:24	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/27/17 11:24	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/27/17 11:24	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/27/17 11:24	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/27/17 11:24	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/27/17 11:24	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/27/17 11:24	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/27/17 11:24	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/27/17 11:24	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/27/17 11:24	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/27/17 11:24	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/27/17 11:24	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/27/17 11:24	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/27/17 11:24	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/27/17 11:24	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/27/17 11:24	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/27/17 11:24	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/27/17 11:24	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/27/17 11:24	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/27/17 11:24	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/27/17 11:24	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/27/17 11:24	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/27/17 11:24	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/27/17 11:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/27/17 11:24	
Acetone	ug/L	<0.64	20.0	0.64	06/27/17 11:24	
Acrolein	ug/L	<2.1	10.0	2.1	06/27/17 11:24	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/27/17 11:24	
Benzene	ug/L	<0.042	0.50	0.042	06/27/17 11:24	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/27/17 11:24	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/27/17 11:24	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/27/17 11:24	
Bromoform	ug/L	<0.11	4.0	0.11	06/27/17 11:24	
Bromomethane	ug/L	<0.20	4.0	0.20	06/27/17 11:24	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/27/17 11:24	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/27/17 11:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

METHOD BLANK: 2624556

Matrix: Water

Associated Lab Samples: 10393161001, 10393161002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/27/17 11:24	
Chloroethane	ug/L	<0.12	1.0	0.12	06/27/17 11:24	
Chloroform	ug/L	<0.21	1.0	0.21	06/27/17 11:24	
Chloromethane	ug/L	<0.080	4.0	0.080	06/27/17 11:24	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/27/17 11:24	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/27/17 11:24	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/27/17 11:24	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/27/17 11:24	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/27/17 11:24	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/27/17 11:24	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/27/17 11:24	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/27/17 11:24	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/27/17 11:24	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/27/17 11:24	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/27/17 11:24	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/27/17 11:24	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/27/17 11:24	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/27/17 11:24	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/27/17 11:24	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/27/17 11:24	
Naphthalene	ug/L	<0.064	1.0	0.064	06/27/17 11:24	
o-Xylene	ug/L	<0.044	0.50	0.044	06/27/17 11:24	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/27/17 11:24	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/27/17 11:24	
Styrene	ug/L	<0.056	0.50	0.056	06/27/17 11:24	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/27/17 11:24	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/27/17 11:24	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/27/17 11:24	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/27/17 11:24	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/27/17 11:24	
Toluene	ug/L	<0.059	0.50	0.059	06/27/17 11:24	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/27/17 11:24	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/27/17 11:24	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/27/17 11:24	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/27/17 11:24	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/27/17 11:24	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/27/17 11:24	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/27/17 11:24	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/27/17 11:24	
1,2-Dichloroethane-d4 (S)	%	104	75-137		06/27/17 11:24	
4-Bromofluorobenzene (S)	%	100	75-125		06/27/17 11:24	
Toluene-d8 (S)	%	100	75-125		06/27/17 11:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

LABORATORY CONTROL SAMPLE & LCSD: 2624557		2624558									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.6	20.2	103	101	75-136	2	30		
1,1,1-Trichloroethane	ug/L	20	21.0	20.6	105	103	75-129	2	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.7	20.6	104	103	71-138	1	30		
1,1,2-Trichloroethane	ug/L	20	21.0	21.0	105	105	75-125	0	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.2	20.7	106	104	69-126	2	30		
1,1-Dichloroethane	ug/L	20	20.6	20.6	103	103	75-125	0	30		
1,1-Dichloroethene	ug/L	20	20.7	21.0	104	105	75-125	1	30		
1,1-Dichloropropene	ug/L	20	20.6	20.1	103	101	75-125	2	30		
1,2,3-Trichlorobenzene	ug/L	20	19.6	19.7	98	99	75-125	1	30		
1,2,3-Trichloropropane	ug/L	20	20.6	20.7	103	104	75-125	1	30		
1,2,4-Trichlorobenzene	ug/L	20	19.7	19.3	99	96	75-125	2	30		
1,2,4-Trimethylbenzene	ug/L	20	19.7	19.3	99	96	75-125	2	30		
1,2-Dibromo-3-chloropropane	ug/L	50	47.0	47.3	94	95	71-130	1	30		
1,2-Dibromoethane (EDB)	ug/L	20	21.6	21.3	108	106	75-125	2	30		
1,2-Dichlorobenzene	ug/L	20	19.2	19.3	96	97	75-125	1	30		
1,2-Dichloroethane	ug/L	20	19.8	20.2	99	101	70-125	2	30		
1,2-Dichloroethene (Total)	ug/L	40	39.3	39.0	98	97	75-125	1	30		
1,2-Dichloropropane	ug/L	20	19.9	20.4	100	102	75-125	2	30		
1,3,5-Trimethylbenzene	ug/L	20	19.7	19.3	99	96	75-125	2	30		
1,3-Dichlorobenzene	ug/L	20	20.6	20.3	103	101	75-125	2	30		
1,3-Dichloropropane	ug/L	20	20.8	20.5	104	102	75-125	1	30		
1,4-Dichlorobenzene	ug/L	20	18.9	19.0	95	95	75-125	0	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	386	398	97	99	64-140	3	30		
2,2,4-Trimethylpentane	ug/L	20	20.7	20.2	103	101	68-125	3	30		
2,2-Dichloropropane	ug/L	20	20.8	20.1	104	100	70-131	3	30		
2-Butanone (MEK)	ug/L	100	105	106	105	106	69-125	2	30		
2-Chlorotoluene	ug/L	20	19.5	19.1	98	96	75-125	2	30		
2-Hexanone	ug/L	100	109	111	109	111	73-129	1	30		
4-Chlorotoluene	ug/L	20	20.2	19.8	101	99	75-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	104	105	104	73-125	1	30		
Acetone	ug/L	100	133	123	133	123	66-126	8	30	L1	
Acrolein	ug/L	200	233	239	116	119	56-150	2	30		
Acrylonitrile	ug/L	200	199	202	100	101	68-129	1	30		
Benzene	ug/L	20	19.4	19.2	97	96	75-125	1	30		
Bromobenzene	ug/L	20	20.0	19.6	100	98	75-125	2	30		
Bromochloromethane	ug/L	20	20.3	20.6	102	103	75-126	1	30		
Bromodichloromethane	ug/L	20	21.1	21.0	106	105	75-133	0	30		
Bromoform	ug/L	20	18.0	18.1	90	91	62-142	0	30		
Bromomethane	ug/L	20	15.4	16.8	77	84	34-143	9	30		
Carbon disulfide	ug/L	20	20.6	20.4	103	102	71-125	1	30		
Carbon tetrachloride	ug/L	20	20.9	20.7	105	104	71-145	1	30		
Chlorobenzene	ug/L	20	19.9	19.6	100	98	75-125	2	30		
Chloroethane	ug/L	20	21.7	20.9	109	104	75-125	4	30		
Chloroform	ug/L	20	19.1	19.4	96	97	75-125	2	30		
Chloromethane	ug/L	20	18.1	18.1	91	90	54-125	0	30		
cis-1,2-Dichloroethene	ug/L	20	19.3	19.5	97	98	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	20	20.4	20.1	102	101	75-125	1	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

LABORATORY CONTROL SAMPLE & LCSD: 2624557		2624558									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	21.1	20.7	105	103	74-141	2	30		
Dibromomethane	ug/L	20	20.5	20.8	102	104	75-125	1	30		
Dichlorodifluoromethane	ug/L	20	23.2	22.6	116	113	59-130	2	30		
Dichlorofluoromethane	ug/L	20	20.6	20.1	103	101	75-125	3	30		
Diisopropyl ether	ug/L	20	19.4	19.7	97	98	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.3	19.7	97	99	73-125	2	30		
Ethylbenzene	ug/L	20	19.8	18.9	99	95	75-125	5	30		
Hexachloro-1,3-butadiene	ug/L	20	21.4	20.0	107	100	75-131	7	30		
Isopropylbenzene (Cumene)	ug/L	20	19.6	19.4	98	97	75-125	1	30		
m&p-Xylene	ug/L	40	40.4	39.3	101	98	75-125	3	30		
Methyl-tert-butyl ether	ug/L	20	19.6	20.1	98	100	75-125	3	30		
Methylene Chloride	ug/L	20	19.3	19.8	96	99	73-125	3	30		
n-Butylbenzene	ug/L	20	21.9	20.9	110	104	75-125	5	30		
n-Propylbenzene	ug/L	20	19.9	19.2	99	96	75-125	3	30		
Naphthalene	ug/L	20	18.5	19.1	92	95	74-125	3	30		
o-Xylene	ug/L	20	19.7	19.4	98	97	75-125	1	30		
p-Isopropyltoluene	ug/L	20	20.8	19.8	104	99	75-125	5	30		
sec-Butylbenzene	ug/L	20	20.3	19.4	101	97	75-125	4	30		
Styrene	ug/L	20	20.2	20.4	101	102	75-125	1	30		
tert-Amylmethyl ether	ug/L	20	19.3	19.8	97	99	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	213	214	107	107	69-131	0	30		
tert-Butylbenzene	ug/L	20	19.2	18.7	96	93	75-125	3	30		
Tetrachloroethene	ug/L	20	21.1	19.4	106	97	75-125	9	30		
Tetrahydrofuran	ug/L	200	191	169	95	85	65-127	12	30		
Toluene	ug/L	20	20.1	19.2	100	96	75-125	4	30		
trans-1,2-Dichloroethene	ug/L	20	20.0	19.4	100	97	75-125	3	30		
trans-1,3-Dichloropropene	ug/L	20	20.5	19.9	102	99	75-125	3	30		
trans-1,4-Dichloro-2-butene	ug/L	50	47.5	48.9	95	98	30-150	3	30		
Trichloroethene	ug/L	20	20.8	20.0	104	100	75-125	4	30		
Trichlorofluoromethane	ug/L	20	21.6	21.3	108	106	71-140	2	30		
Vinyl acetate	ug/L	20	21.9	21.9	109	109	68-137	0	30		
Vinyl chloride	ug/L	20	21.2	20.8	106	104	70-125	2	30		
Xylene (Total)	ug/L	60	60.0	58.7	100	98	75-125	2	30		
1,2-Dichloroethane-d4 (S)	%				101	104	75-137				
4-Bromofluorobenzene (S)	%				99	99	75-125				
Toluene-d8 (S)	%				103	102	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393161

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 481810

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393161

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10393161001	Reed-GW-062017	EPA 8260B	481810		
10393161002	TRIP BLANK-062017	EPA 8260B	481810		

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**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M Hill      **Project #:** \_\_\_\_\_

WO# : 10393161



10393161

**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_  
**Tracking Number:** 7021 4575 3735

**Custody Seal on Cooler/Box Present?**  Yes     No      **Seals Intact?**  Yes     No  
**Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**  Yes     No

**Thermometer Used:**  151401163     151401164      **Type of Ice:**  Wet     Blue     None     Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 4.5      **Cooler Temp Corrected (°C):** 4.6      **Biological Tissue Frozen?**  Yes     No     N/A  
Temp should be above freezing to 6°C      **Correction Factor:** 10.1      **Date and Initials of Person Examining Contents:** ME 6-22-17

**USDA Regulated Soil** (  N/A, water sample)  
Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <u>wt</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix:	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed:      Lot # of added preservative:
Per method VOA pH is checked after analysis	
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>1/1 Trip Blank</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>1 Trip Blank</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>040317-3DBB</u>	

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**  Yes     No  
Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1000</u>	Temp: <u>4.5</u>	Corrected Temp: <u>4.6</u>
Time: _____	put in cooler	
Time: <u>1012</u>	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS      **Date:** 06/22/17  
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

July 12, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

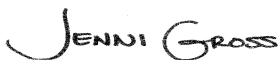
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414	Minnesota Certification #: 027-053-137
A2LA Certification #: 2926.01	Mississippi Certification #: MN00064
Alabama Certification #: 40770	Montana Certification #: CERT0092
Alaska Contaminated Sites Certification #: UST-078	Nebraska Certification #: NE-OS-18-06
Alaska DW Certification #: MN00064	Nevada Certification #: MN00064
Arizona Certification #: AZ0014	New Hampshire Certification #: 2081
Arkansas Certification #: 88-0680	New Jersey Certification #: MN002
California Certification #: MN00064	New York Certification #: 11647
CNMI Saipan Certification #:MP0003	North Carolina DW Certification #: 27700
Colorado Certification #: MN00064	North Carolina WW Certification #: 530
Connecticut Certification #: PH-0256	North Dakota Certification #: R-036
EPA Region 8 Certification #: 8TMS-L	Ohio DW Certification #: 41244
Florida Certification #: E87605	Ohio VAP Certification #: CL101
Georgia Certification #: 959	Oklahoma Certification #: 9507
Guam EPA Certification #: MN00064	Oregon NwTPH Certification #: MN300001
Hawaii Certification #: MN00064	Oregon Secondary Certification #: MN200001
Idaho Certification #: MN00064	Pennsylvania Certification #: 68-00563
Illinois Certification #: 200011	Puerto Rico Certification #: MN00064
Indiana Certification #: C-MN-01	South Carolina Certification #:74003001
Iowa Certification #: 368	Tennessee Certification #: TN02818
Kansas Certification #: E-10167	Texas Certification #: T104704192
Kentucky DW Certification #: 90062	Utah Certification #: MN00064
Kentucky WW Certification #: 90062	Virginia Certification #: 460163
Louisiana DEQ Certification #: 03086	Washington Certification #: C486
Louisiana DW Certification #: MN00064	West Virginia DW Certification #: 9952 C
Maine Certification #: MN00064	West Virginia WW Certification #: 382
Maryland Certification #: 322	Wisconsin Certification #: 999407970
Michigan Certification #: 9909	Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792	Minnesota Dept of Health Certification #: 027-137-445
Alaska Certification UST-107	North Dakota Certification: # R-203
Alaska Certification UST-107	Wisconsin DNR Certification # : 998027470
California Certification #2973	WA Department of Ecology Lab ID# C1007
California Certification #2973	Nevada DNR #MN010842015-1
Montana Certificate #CERT0103	Oklahoma Department of Environmental Quality
Alaska Certification #MN01084	California Certification #2973
Arizona Department of Health Certification #AZ0785	

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA	Pennsylvania Dept. of Env Protection (NELAC): 68-04202
Florida Department of Health (NELAC): E87595	Texas Commission on Env. Quality (NELAC): T104704405-09-TX
Illinois Environmental Protection Agency: 0025721	U.S. Dept. of Agriculture Foreign Soil Import: P330-10- 00119
Kansas Department of Health and Environment (NELAC): E-10266	Commonwealth of Virginia (TNI): 480246
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006	

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10393711001	MW19D-GW-062617	Water	06/26/17 11:40	06/27/17 09:30
10393711002	Thorson-GW-062617	Water	06/26/17 12:40	06/27/17 09:30
10393711003	Marlow #2-GW-062617	Water	06/26/17 15:00	06/27/17 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10393711001	MW19D-GW-062617	RSK 175	MJL	3	PASI-M		
		6010C Met	DM	22	PASI-M		
		EPA 7470A	LMW	1	PASI-M		
		SM 2320B	JFP	1	PASI-M		
		SM 2540C	NAS	1	PASI-M		
		SM 4500-S-2 D	MCT	1	PASI-N		
		EPA 300.0	KEO	3	PASI-M		
		SM 3500-Cr D Modified	JFP	1	PASI-M		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	DCL	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		
		10393711002	Thorson-GW-062617	RSK 175	MJL	3	PASI-M
				6010C Met	DM	22	PASI-M
EPA 7470A	LMW			1	PASI-M		
SM 2320B	JFP			1	PASI-M		
SM 2540C	NAS			1	PASI-M		
SM 4500-S-2 D	MCT			1	PASI-N		
EPA 300.0	KEO			3	PASI-M		
SM 3500-Cr D Modified	JFP			1	PASI-M		
EPA 353.2	JFP			1	PASI-M		
EPA 410.4	DCL			1	PASI-M		
SM 5310C	CRE			1	PASI-V		
10393711003	Marlow #2-GW-062617			RSK 175	MJL	3	PASI-M
				6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M		
		SM 2320B	JFP	1	PASI-M		
		SM 2540C	NAS	1	PASI-M		
		SM 4500-S-2 D	MCT	1	PASI-N		
		EPA 300.0	KEO	3	PASI-M		
		SM 3500-Cr D Modified	JFP	1	PASI-M		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	DCL	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10393711001</b>	<b>MW19D-GW-062617</b>					
RSK 175	Methane	1.5J	ug/L	10.0	06/28/17 09:52	
6010C Met	Aluminum, Dissolved	11.5J	ug/L	200	07/06/17 16:47	
6010C Met	Arsenic, Dissolved	6.8J	ug/L	20.0	07/06/17 16:47	
6010C Met	Barium, Dissolved	62.1	ug/L	10.0	07/06/17 16:47	
6010C Met	Calcium, Dissolved	50500	ug/L	500	07/06/17 16:47	
6010C Met	Copper, Dissolved	2.0J	ug/L	10.0	07/06/17 16:47	
6010C Met	Magnesium, Dissolved	14400	ug/L	500	07/06/17 16:47	
6010C Met	Manganese, Dissolved	10.9	ug/L	5.0	07/06/17 16:47	
6010C Met	Potassium, Dissolved	2220J	ug/L	2500	07/06/17 16:47	
6010C Met	Sodium, Dissolved	14600	ug/L	1000	07/06/17 16:47	
6010C Met	Thallium, Dissolved	6.4J	ug/L	20.0	07/06/17 16:47	
6010C Met	Vanadium, Dissolved	6.2J	ug/L	15.0	07/06/17 16:47	
6010C Met	Zinc, Dissolved	3.2J	ug/L	20.0	07/06/17 16:47	
SM 2320B	Alkalinity, Total as CaCO3	162	mg/L	5.0	06/29/17 13:13	
SM 2540C	Total Dissolved Solids	319	mg/L	10.0	06/28/17 09:03	
EPA 300.0	Chloride	12.0	mg/L	1.2	06/27/17 12:56	
EPA 300.0	Nitrate as N	4.4	mg/L	0.10	06/27/17 12:56	
EPA 300.0	Sulfate	35.5	mg/L	1.2	06/27/17 12:56	
SM 3500-Cr D Modified	Chromium, Hexavalent	0.0086J	mg/L	0.010	06/27/17 12:39	B, H1
EPA 353.2	Nitrogen, NO2 plus NO3	4.0	mg/L	0.10	06/29/17 13:10	
SM 5310C	Total Organic Carbon	0.61J	mg/L	1.0	07/11/17 04:05	
<b>10393711002</b>	<b>Thorson-GW-062617</b>					
RSK 175	Methane	1.7J	ug/L	10.0	06/28/17 10:00	
6010C Met	Barium, Dissolved	79.9	ug/L	10.0	07/06/17 16:49	
6010C Met	Calcium, Dissolved	23700	ug/L	500	07/06/17 16:49	
6010C Met	Copper, Dissolved	4.5J	ug/L	10.0	07/06/17 16:49	
6010C Met	Iron, Dissolved	98.8	ug/L	50.0	07/06/17 16:49	
6010C Met	Magnesium, Dissolved	12100	ug/L	500	07/06/17 16:49	
6010C Met	Manganese, Dissolved	27.2	ug/L	5.0	07/06/17 16:49	
6010C Met	Potassium, Dissolved	3850	ug/L	2500	07/06/17 16:49	
6010C Met	Sodium, Dissolved	14700	ug/L	1000	07/06/17 16:49	
6010C Met	Zinc, Dissolved	11.2J	ug/L	20.0	07/06/17 16:49	
SM 2320B	Alkalinity, Total as CaCO3	146	mg/L	5.0	06/29/17 13:27	
SM 2540C	Total Dissolved Solids	185	mg/L	10.0	06/30/17 09:47	
EPA 300.0	Chloride	1.2	mg/L	1.2	06/27/17 13:12	
EPA 300.0	Sulfate	3.2	mg/L	1.2	06/27/17 13:12	B
SM 3500-Cr D Modified	Chromium, Hexavalent	0.0033J	mg/L	0.010	06/27/17 12:39	B
<b>10393711003</b>	<b>Marlow #2-GW-062617</b>					
RSK 175	Methane	2.2J	ug/L	10.0	06/28/17 10:07	
6010C Met	Barium, Dissolved	43.6	ug/L	10.0	07/06/17 16:52	
6010C Met	Calcium, Dissolved	38800	ug/L	500	07/06/17 16:52	
6010C Met	Copper, Dissolved	1.7J	ug/L	10.0	07/06/17 16:52	
6010C Met	Magnesium, Dissolved	10600	ug/L	500	07/06/17 16:52	
6010C Met	Manganese, Dissolved	56.0	ug/L	5.0	07/06/17 16:52	
6010C Met	Potassium, Dissolved	836J	ug/L	2500	07/06/17 16:52	
6010C Met	Sodium, Dissolved	13800	ug/L	1000	07/06/17 16:52	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393711003</b>	<b>Marlow #2-GW-062617</b>					
6010C Met	Thallium, Dissolved	6.0J	ug/L	20.0	07/06/17 16:52	
6010C Met	Vanadium, Dissolved	0.64J	ug/L	15.0	07/06/17 16:52	
6010C Met	Zinc, Dissolved	11.1J	ug/L	20.0	07/06/17 16:52	
SM 2320B	Alkalinity, Total as CaCO3	155	mg/L	5.0	06/29/17 13:31	
SM 2540C	Total Dissolved Solids	193	mg/L	10.0	06/30/17 09:47	
EPA 300.0	Chloride	3.9	mg/L	1.2	06/27/17 13:27	
EPA 300.0	Nitrate as N	0.38	mg/L	0.10	06/27/17 13:27	
EPA 300.0	Sulfate	13.2	mg/L	1.2	06/27/17 13:27	
EPA 353.2	Nitrogen, NO2 plus NO3	0.38	mg/L	0.020	06/29/17 12:32	
SM 5310C	Total Organic Carbon	3.2	mg/L	1.0	07/11/17 04:32	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482415

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393443002,10393845001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2627676)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 83693

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2056918001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 356545)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

### General Information:

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 481817

B: Analyte was detected in the associated method blank.

- BLANK for HBN 481817 [WETA/316 (Lab ID: 2624574)
- Sulfate

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481817

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393658001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2624576)
  - Chloride
- MSD (Lab ID: 2624577)
  - Chloride

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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**Method:** SM 3500-Cr D Modified

**Description:** Chromium, Hexavalent

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

### General Information:

3 samples were analyzed for SM 3500-Cr D Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW19D-GW-062617 (Lab ID: 10393711001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 481919

B: Analyte was detected in the associated method blank.

- BLANK for HBN 481919 [WETA/316 (Lab ID: 2624955)
- Chromium, Hexavalent

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481919

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393711003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2624957)
  - Chromium, Hexavalent
- MSD (Lab ID: 2624958)
  - Chromium, Hexavalent

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 482462

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2627870)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2627871)
  - Nitrogen, NO2 plus NO3

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482649

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10394020001,10394020002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2629157)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2629159)
  - Chemical Oxygen Demand

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

**Sample:** MW19D-GW-062617      **Lab ID:** 10393711001      Collected: 06/26/17 11:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/28/17 09:52	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/28/17 09:52	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		06/28/17 09:52	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	11.5J	ug/L	200	8.6	1	07/06/17 11:04	07/06/17 16:47	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/06/17 11:04	07/06/17 16:47	7440-36-0	
Arsenic, Dissolved	6.8J	ug/L	20.0	5.2	1	07/06/17 11:04	07/06/17 16:47	7440-38-2	
Barium, Dissolved	62.1	ug/L	10.0	0.22	1	07/06/17 11:04	07/06/17 16:47	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/06/17 11:04	07/06/17 16:47	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/06/17 11:04	07/06/17 16:47	7440-43-9	
Calcium, Dissolved	50500	ug/L	500	24.7	1	07/06/17 11:04	07/06/17 16:47	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/06/17 11:04	07/06/17 16:47	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/06/17 11:04	07/06/17 16:47	7440-48-4	
Copper, Dissolved	2.0J	ug/L	10.0	0.83	1	07/06/17 11:04	07/06/17 16:47	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/06/17 11:04	07/06/17 16:47	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/06/17 11:04	07/06/17 16:47	7439-92-1	
Magnesium, Dissolved	14400	ug/L	500	2.6	1	07/06/17 11:04	07/06/17 16:47	7439-95-4	
Manganese, Dissolved	10.9	ug/L	5.0	0.38	1	07/06/17 11:04	07/06/17 16:47	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/06/17 11:04	07/06/17 16:47	7440-02-0	
Potassium, Dissolved	2220J	ug/L	2500	126	1	07/06/17 11:04	07/06/17 16:47	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/06/17 11:04	07/06/17 16:47	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/06/17 11:04	07/06/17 16:47	7440-22-4	
Sodium, Dissolved	14600	ug/L	1000	44.6	1	07/06/17 11:04	07/06/17 16:47	7440-23-5	
Thallium, Dissolved	6.4J	ug/L	20.0	4.8	1	07/06/17 11:04	07/06/17 16:47	7440-28-0	
Vanadium, Dissolved	6.2J	ug/L	15.0	0.42	1	07/06/17 11:04	07/06/17 16:47	7440-62-2	
Zinc, Dissolved	3.2J	ug/L	20.0	1.8	1	07/06/17 11:04	07/06/17 16:47	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/06/17 09:33	07/06/17 12:53	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	162	mg/L	5.0	1.4	1		06/29/17 13:13		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	319	mg/L	10.0	5.0	1		06/28/17 09:03		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/29/17 16:40	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	12.0	mg/L	1.2	0.10	1		06/27/17 12:56	16887-00-6	
Nitrate as N	4.4	mg/L	0.10	0.013	1		06/27/17 12:56	14797-55-8	
Sulfate	35.5	mg/L	1.2	0.16	1		06/27/17 12:56	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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**Sample: MW19D-GW-062617**      **Lab ID: 10393711001**      Collected: 06/26/17 11:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Chromium, Hexavalent</b>	Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	<b>0.0086J</b>	mg/L	0.010	0.0021	1		06/27/17 12:39		B,H1
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.0</b>	mg/L	0.10	0.037	5		06/29/17 13:10		
<b>410.4 COD</b>	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/05/17 12:51	07/06/17 12:39		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.61J</b>	mg/L	1.0	0.20	1		07/11/17 04:05	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

**Sample: Thorson-GW-062617**      **Lab ID: 10393711002**      Collected: 06/26/17 12:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/28/17 10:00	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/28/17 10:00	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		06/28/17 10:00	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/06/17 11:04	07/06/17 16:49	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/06/17 11:04	07/06/17 16:49	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/06/17 11:04	07/06/17 16:49	7440-38-2	
Barium, Dissolved	79.9	ug/L	10.0	0.22	1	07/06/17 11:04	07/06/17 16:49	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/06/17 11:04	07/06/17 16:49	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/06/17 11:04	07/06/17 16:49	7440-43-9	
Calcium, Dissolved	23700	ug/L	500	24.7	1	07/06/17 11:04	07/06/17 16:49	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/06/17 11:04	07/06/17 16:49	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/06/17 11:04	07/06/17 16:49	7440-48-4	
Copper, Dissolved	4.5J	ug/L	10.0	0.83	1	07/06/17 11:04	07/06/17 16:49	7440-50-8	
Iron, Dissolved	98.8	ug/L	50.0	16.7	1	07/06/17 11:04	07/06/17 16:49	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/06/17 11:04	07/06/17 16:49	7439-92-1	
Magnesium, Dissolved	12100	ug/L	500	2.6	1	07/06/17 11:04	07/06/17 16:49	7439-95-4	
Manganese, Dissolved	27.2	ug/L	5.0	0.38	1	07/06/17 11:04	07/06/17 16:49	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/06/17 11:04	07/06/17 16:49	7440-02-0	
Potassium, Dissolved	3850	ug/L	2500	126	1	07/06/17 11:04	07/06/17 16:49	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/06/17 11:04	07/06/17 16:49	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/06/17 11:04	07/06/17 16:49	7440-22-4	
Sodium, Dissolved	14700	ug/L	1000	44.6	1	07/06/17 11:04	07/06/17 16:49	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	07/06/17 11:04	07/06/17 16:49	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	07/06/17 11:04	07/06/17 16:49	7440-62-2	
Zinc, Dissolved	11.2J	ug/L	20.0	1.8	1	07/06/17 11:04	07/06/17 16:49	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/06/17 09:33	07/06/17 12:55	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	146	mg/L	5.0	1.4	1		06/29/17 13:27		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	185	mg/L	10.0	5.0	1		06/30/17 09:47		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/29/17 16:40	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.2	mg/L	1.2	0.10	1		06/27/17 13:12	16887-00-6	
Nitrate as N	<0.013	mg/L	0.10	0.013	1		06/27/17 13:12	14797-55-8	
Sulfate	3.2	mg/L	1.2	0.16	1		06/27/17 13:12	14808-79-8	B

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

**Sample: Thorson-GW-062617**      **Lab ID: 10393711002**      Collected: 06/26/17 12:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Chromium, Hexavalent</b>	Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	<b>0.0033J</b>	mg/L	0.010	0.0021	1		06/27/17 12:39		B
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		06/29/17 12:31		
<b>410.4 COD</b>	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/05/17 12:51	07/06/17 12:40		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		07/11/17 04:18	7440-44-0	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

**Sample: Marlow #2-GW-062617**      **Lab ID: 10393711003**      Collected: 06/26/17 15:00      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/28/17 10:07	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/28/17 10:07	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		06/28/17 10:07	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/06/17 11:04	07/06/17 16:52	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/06/17 11:04	07/06/17 16:52	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/06/17 11:04	07/06/17 16:52	7440-38-2	
Barium, Dissolved	43.6	ug/L	10.0	0.22	1	07/06/17 11:04	07/06/17 16:52	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/06/17 11:04	07/06/17 16:52	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/06/17 11:04	07/06/17 16:52	7440-43-9	
Calcium, Dissolved	38800	ug/L	500	24.7	1	07/06/17 11:04	07/06/17 16:52	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/06/17 11:04	07/06/17 16:52	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/06/17 11:04	07/06/17 16:52	7440-48-4	
Copper, Dissolved	1.7J	ug/L	10.0	0.83	1	07/06/17 11:04	07/06/17 16:52	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/06/17 11:04	07/06/17 16:52	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/06/17 11:04	07/06/17 16:52	7439-92-1	
Magnesium, Dissolved	10600	ug/L	500	2.6	1	07/06/17 11:04	07/06/17 16:52	7439-95-4	
Manganese, Dissolved	56.0	ug/L	5.0	0.38	1	07/06/17 11:04	07/06/17 16:52	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/06/17 11:04	07/06/17 16:52	7440-02-0	
Potassium, Dissolved	836J	ug/L	2500	126	1	07/06/17 11:04	07/06/17 16:52	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/06/17 11:04	07/06/17 16:52	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/06/17 11:04	07/06/17 16:52	7440-22-4	
Sodium, Dissolved	13800	ug/L	1000	44.6	1	07/06/17 11:04	07/06/17 16:52	7440-23-5	
Thallium, Dissolved	6.0J	ug/L	20.0	4.8	1	07/06/17 11:04	07/06/17 16:52	7440-28-0	
Vanadium, Dissolved	0.64J	ug/L	15.0	0.42	1	07/06/17 11:04	07/06/17 16:52	7440-62-2	
Zinc, Dissolved	11.1J	ug/L	20.0	1.8	1	07/06/17 11:04	07/06/17 16:52	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/06/17 09:33	07/06/17 12:57	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	155	mg/L	5.0	1.4	1		06/29/17 13:31		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	193	mg/L	10.0	5.0	1		06/30/17 09:47		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/29/17 16:40	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.9	mg/L	1.2	0.10	1		06/27/17 13:27	16887-00-6	
Nitrate as N	0.38	mg/L	0.10	0.013	1		06/27/17 13:27	14797-55-8	
Sulfate	13.2	mg/L	1.2	0.16	1		06/27/17 13:27	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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**Sample: Marlow #2-GW-062617**      **Lab ID: 10393711003**      Collected: 06/26/17 15:00      Received: 06/27/17 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Chromium, Hexavalent</b>	Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	<b>&lt;0.0021</b>	mg/L	0.010	0.0021	1		06/27/17 12:39		M1
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.38</b>	mg/L	0.020	0.0075	1		06/29/17 12:32		
<b>410.4 COD</b>	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/05/17 12:51	07/06/17 12:40		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.2</b>	mg/L	1.0	0.20	1		07/11/17 04:32	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

QC Batch: 482086 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2625787 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/28/17 08:59	
Ethene	ug/L	<0.68	10.0	0.68	06/28/17 08:59	
Methane	ug/L	1.6J	10.0	1.1	06/28/17 08:59	

LABORATORY CONTROL SAMPLE & LCSD: 2625788

Parameter	Units	2625789								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	105	109	92	96	85-115	4	20	
Ethene	ug/L	106	99.6	103	94	97	85-115	3	20	
Methane	ug/L	60.7	57.2	58.9	94	97	85-115	3	20	

SAMPLE DUPLICATE: 2625790

Parameter	Units	35320066013				Max RPD	Qualifiers
		Result	Dup Result	RPD	RPD		
Ethane	ug/L	7.2J	7.9J		20		
Ethene	ug/L	2.1J	2.2J		20		
Methane	ug/L	505	565	11	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

QC Batch: 482065

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2625703

Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	07/06/17 12:46	

LABORATORY CONTROL SAMPLE & LCSD: 2625704

2632571

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.5	5.7	111	114	80-120	3	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

QC Batch: 482057 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2625671 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	07/06/17 16:36	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	07/06/17 16:36	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	07/06/17 16:36	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	07/06/17 16:36	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	07/06/17 16:36	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	07/06/17 16:36	
Calcium, Dissolved	ug/L	<24.7	500	24.7	07/06/17 16:36	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	07/06/17 16:36	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	07/06/17 16:36	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	07/06/17 16:36	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	07/06/17 16:36	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	07/06/17 16:36	
Magnesium, Dissolved	ug/L	3.0J	500	2.6	07/06/17 16:36	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	07/06/17 16:36	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	07/06/17 16:36	
Potassium, Dissolved	ug/L	<126	2500	126	07/06/17 16:36	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	07/06/17 16:36	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	07/06/17 16:36	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	07/06/17 16:36	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	07/06/17 16:36	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	07/06/17 16:36	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	07/06/17 16:36	

LABORATORY CONTROL SAMPLE & LCSD: 2625672 2632570

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20900	20800	105	104	80-120	0	20	
Antimony, Dissolved	ug/L	1000	997	1000	100	100	80-120	1	20	
Arsenic, Dissolved	ug/L	1000	985	982	98	98	80-120	0	20	
Barium, Dissolved	ug/L	1000	996	992	100	99	80-120	0	20	
Beryllium, Dissolved	ug/L	1000	1000	999	100	100	80-120	0	20	
Cadmium, Dissolved	ug/L	1000	984	980	98	98	80-120	0	20	
Calcium, Dissolved	ug/L	20000	18700	18700	94	93	80-120	0	20	
Chromium, Dissolved	ug/L	1000	979	978	98	98	80-120	0	20	
Cobalt, Dissolved	ug/L	1000	979	977	98	98	80-120	0	20	
Copper, Dissolved	ug/L	1000	976	973	98	97	80-120	0	20	
Iron, Dissolved	ug/L	20000	19700	19800	99	99	80-120	0	20	
Lead, Dissolved	ug/L	1000	992	989	99	99	80-120	0	20	
Magnesium, Dissolved	ug/L	20000	19500	19500	98	98	80-120	0	20	
Manganese, Dissolved	ug/L	1000	997	995	100	99	80-120	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

Parameter	Units	LABORATORY CONTROL SAMPLE & LCSD: 2625672		2632570			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Nickel, Dissolved	ug/L	1000	990	989	99	99	80-120	0	20	
Potassium, Dissolved	ug/L	20000	19600	19500	98	98	80-120	0	20	
Selenium, Dissolved	ug/L	1000	1040	1040	104	104	80-120	0	20	
Silver, Dissolved	ug/L	500	482	481	96	96	80-120	0	20	
Sodium, Dissolved	ug/L	20000	19400	19400	97	97	80-120	0	20	
Thallium, Dissolved	ug/L	1000	999	993	100	99	80-120	1	20	
Vanadium, Dissolved	ug/L	1000	952	949	95	95	80-120	0	20	
Zinc, Dissolved	ug/L	1000	965	964	97	96	80-120	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

QC Batch: 482415 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2627670 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	06/29/17 10:52	

LABORATORY CONTROL SAMPLE & LCSD: 2627671 2627672

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	42.4	42.3	106	106	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627673 2627674

Parameter	Units	10393443002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	285	40	40	327	318	104	82	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627675 2627676

Parameter	Units	10393845001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	295	40	40	340	350	111	138	80-120	3	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

QC Batch: 482651

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10393711002, 10393711003

METHOD BLANK: 2629164

Matrix: Water

Associated Lab Samples: 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/30/17 09:47	

LABORATORY CONTROL SAMPLE: 2629165

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	938	94	80-120	

SAMPLE DUPLICATE: 2629166

Parameter	Units	10394141004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	168	171	2	10	

SAMPLE DUPLICATE: 2629167

Parameter	Units	10394141005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	131	131	0	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

QC Batch: 83693

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 356515

Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/29/17 16:39	

LABORATORY CONTROL SAMPLE: 356516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	106	90-110	

MATRIX SPIKE SAMPLE: 356545

Parameter	Units	2056918001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.045	22	75-125	M1

SAMPLE DUPLICATE: 356544

Parameter	Units	2056918001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

QC Batch: 481817 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2624574 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/27/17 09:17	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/27/17 09:17	
Sulfate	mg/L	0.39J	1.2	0.16	06/27/17 09:17	

LABORATORY CONTROL SAMPLE: 2624575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.7	102	90-110	
Nitrate as N	mg/L	1	0.99	99	90-110	
Sulfate	mg/L	12.5	12.3	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2624576 2624577

Parameter	Units	10393658001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	581	125	125	668	670	70	72	90-110	0	20	M6	
Nitrate as N	mg/L	ND	1	1	1.0	1.0	96	96	90-110	0	20		
Sulfate	mg/L	173	125	125	290	291	94	95	90-110	0	20		

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

QC Batch: 481919 Analysis Method: SM 3500-Cr D Modified  
 QC Batch Method: SM 3500-Cr D Modified Analysis Description: Chromium, Hexavalent by 3500  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2624955 Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	0.0042J	0.010	0.0021	06/27/17 12:39	

LABORATORY CONTROL SAMPLE: 2624956

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.19	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2624957 2624958

Parameter	Units	10393711003		2624957		2624958		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chromium, Hexavalent	mg/L	<0.0021	.2	.2	.2	0.15	0.15	77	74	85-115	4	20 M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

QC Batch: 482462 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2627866 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/29/17 12:41	FS

LABORATORY CONTROL SAMPLE: 2627867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.94	94	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627868 2627869

Parameter	Units	10393443001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	0.84	1	1	1	1.8	1.8	96	99	90-110	2	20			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627870 2627871

Parameter	Units	10393443002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	1.4	1	1	1	2.3	2.3	91	92	90-110	0	20	E		

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

QC Batch: 482649 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2629154 Matrix: Water  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	07/06/17 12:36	

LABORATORY CONTROL SAMPLE: 2629155

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	302	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629156 2629157

Parameter	Units	10394020001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chemical Oxygen Demand	mg/L	1020	250	1260	250	1250	94	89	90-110	1	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629158 2629159

Parameter	Units	10394020002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chemical Oxygen Demand	mg/L	1150	250	1380	250	1370	91	88	90-110	0	20	M1

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

QC Batch: 118819 Analysis Method: SM 5310C  
 QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 470457 Matrix: Water  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	07/11/17 01:14	

LABORATORY CONTROL SAMPLE: 470458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 470459 470460

Parameter	Units	10394667001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	294	250	250	556	541	105	99	80-120	3	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 470461 470462

Parameter	Units	10394025004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	2.5	25	25	29.6	29.6	108	109	80-120	0	20				

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393711

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393711

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10393711001	MW19D-GW-062617	RSK 175	482086		
10393711002	Thorson-GW-062617	RSK 175	482086		
10393711003	Marlow #2-GW-062617	RSK 175	482086		
10393711001	MW19D-GW-062617	EPA 3010	482057	6010C Met	483526
10393711002	Thorson-GW-062617	EPA 3010	482057	6010C Met	483526
10393711003	Marlow #2-GW-062617	EPA 3010	482057	6010C Met	483526
10393711001	MW19D-GW-062617	EPA 7470A	482065	EPA 7470A	483468
10393711002	Thorson-GW-062617	EPA 7470A	482065	EPA 7470A	483468
10393711003	Marlow #2-GW-062617	EPA 7470A	482065	EPA 7470A	483468
10393711001	MW19D-GW-062617	SM 2320B	482415		
10393711002	Thorson-GW-062617	SM 2320B	482415		
10393711003	Marlow #2-GW-062617	SM 2320B	482415		
10393711001	MW19D-GW-062617	SM 2540C	482084		
10393711002	Thorson-GW-062617	SM 2540C	482651		
10393711003	Marlow #2-GW-062617	SM 2540C	482651		
10393711001	MW19D-GW-062617	SM 4500-S-2 D	83693		
10393711002	Thorson-GW-062617	SM 4500-S-2 D	83693		
10393711003	Marlow #2-GW-062617	SM 4500-S-2 D	83693		
10393711001	MW19D-GW-062617	EPA 300.0	481817		
10393711002	Thorson-GW-062617	EPA 300.0	481817		
10393711003	Marlow #2-GW-062617	EPA 300.0	481817		
10393711001	MW19D-GW-062617	SM 3500-Cr D Modified	481919		
10393711002	Thorson-GW-062617	SM 3500-Cr D Modified	481919		
10393711003	Marlow #2-GW-062617	SM 3500-Cr D Modified	481919		
10393711001	MW19D-GW-062617	EPA 353.2	482462		
10393711002	Thorson-GW-062617	EPA 353.2	482462		
10393711003	Marlow #2-GW-062617	EPA 353.2	482462		
10393711001	MW19D-GW-062617	EPA 410.4	482649	EPA 410.4	483512
10393711002	Thorson-GW-062617	EPA 410.4	482649	EPA 410.4	483512
10393711003	Marlow #2-GW-062617	EPA 410.4	482649	EPA 410.4	483512
10393711001	MW19D-GW-062617	SM 5310C	118819		
10393711002	Thorson-GW-062617	SM 5310C	118819		
10393711003	Marlow #2-GW-062617	SM 5310C	118819		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10393711

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:		Page: 1 Of 1	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Gary Honeyman		Regulatory Agency	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus		Company Name: UPRR		State / Location	
Email: mark.Ochsner@ch2n.com		Purchase Order #:		Address:		WA / Freeman	
Phone: Fax:		Project Name: UPRR_Freeman		Pace Quote: Contract# 758938		State / Location	
Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day		Project #: 1497		Pace Project Manager: Jennifer Gross		WA / Freeman	
				Pace Profile #: 36447			

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	CODE DW WT WW P SL OL WP AR OT TS	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analyzes Test Y/N	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)		
					START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	VOCS by 8260	Dep.Weight		TAL	METALS	Cr6	Fe2+	COD	BOD	CI, SD4, NITRATE	SULFIDE	AIK	TOC		TDS	MEE P&K 175
					DATE	TIME	DATE	TIME																										
1	MW19D-GW-062617	WT	D	G			6/26/17	1140	10	4	4	1	1					X	X	X	X	X	X	X	X	X	X	X	X	X	X	CO1		
2	THORSON-GW-062617	WT	G	G			6/26/17	1240	10	4	4	1	1					X	X	X	X	X	X	X	X	X	X	X	X	X	CO2			
3	MARLOW#2-GW-062617	WT	G	G			6/26/17	1500	10	4	4	1	1					X	X	X	X	X	X	X	X	X	X	X	X	X	CO3			
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS			
		REBECC GREEN CLEAN		6/26/17		1700		FED EX Pace		6/26/17		1700		0.8 Y Y Y			

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: REBECC GREEN	DATE Signed: 6/26/17					
SIGNATURE of SAMPLER: [Signature]						


THIS CHAIN OF CUSTODY REPORT



**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: UPRR CH2M HILL Project #:                     

**WO#: 10393711**



10393711

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other:                     

Tracking Number: 7096 33718841

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other:                           Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 0.7      Cooler Temp Corrected (°C): 0.8      Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C      Correction Factor: 10.1      Date and Initials of Person Examining Contents: ME 6-27-17

USDA Regulated Soil  N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH      Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # <u>1-3 1/1 1/1 1/1</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: <u>                    </u> Lot # of added preservative: <u>                    </u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): <u>                    </u>	

**CLIENT NOTIFICATION/RESOLUTION**      Field Data Required?  Yes  No

Person Contacted: Lindsey Baumann      Date/Time: 06/27/17 11:52 via email/phone

Comments/Resolution: Per Lindsey, Cr+6, ferrous iron and BOD are not required. Added

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	nitrate+nitrite by 353.2.
Opened Time: <u>1012</u> Temp: <u>0.7</u> Corrected Temp: <u>0.8</u>	
Time: <u>                    </u> put in cooler	
Time: <u>1023</u> Temp: <u>                    </u> Corrected Temp: <u>                    </u>	

Project Manager Review: JENNI GROSS      Date: 06/27/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Workorder: 10393711 Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/27/2017 Results Requested By: 7/12/2017

Report To		Subcontract To				Requested Analysis																																																	
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333				5036267 / 4500 Sulfide																																																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																		LAB USE ONLY																															
						Other																																																	
1	MW19D-GW-062617	PS	6/26/2017 11:40	10393711001	Water	1																																																	
2	Thorson-GW-062617	PS	6/26/2017 12:40	10393711002	Water	1																																																	
3	Marlow #2-GW-062617	PS	6/26/2017 15:00	10393711003	Water	1																																																	
4																																																							
5																																																							

Transfers	Released By	Date/Time	Received By	Date/Time	Comments	
1	<i>[Signature]</i>	6/27/17 1345				2 det 6-28-13 0830 J Mulla / Pac 6-28-17 0830
2						
3						

Cooler Temperature on Receipt 2-3°C Custody Seal  or N Received on Ice  or N Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon F

Proj \_\_\_\_\_

# WO#: 2056876

PM: CMM

Due Date: 07/12/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-28-17 AP

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Chain of Custody

WO#: 1290621  
PM: HRZ Due Date: 07/12/17  
CLIENT: PACE MPLS  
Page 43 of 44

Workorder: 10393711

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/27/2017 Results Requested By:

Report To		Subcontract To				Requested Analysis																	
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																					
						5632354 / 5310 LOC																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers						LAB USE ONLY											
						H2SO4																	
1	MW19D-GW-062617	PS	6/26/2017 11:40	10393711001	Water	3																	
2	Thorson-GW-062617	PS	6/26/2017 12:40	10393711002	Water	3																	
3	Marlow #2-GW-062617	PS	6/26/2017 15:00	10393711003	Water	3																	
4																							
5																							

Transfers	Released By	Date/Time	Received By	Date/Time	Comments			
1	Pace MN	6/27/17 1340		6/28/17 1435				
2		6/29/17 2245		6/29 08100				
3								

Cooler Temperature on Receipt 1.7 °C Custody Seal  or N Received on Ice  or N Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:  
**Sample Condition Upon Receipt Form**  
 Document No.:  
 F-VM-C-001-Rev.10

Document Revised: 15Mar2016  
 Page 1 of 1  
 Issuing Authority:  
 Pace Virginia, Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: Pace Milk Project #: \_\_\_\_\_

**WO#: 1290621**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read °C: 1.4 Cooler Temp Corrected °C: 1.7 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: PLC 6/28/17  
 Comments: WV 6/29/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N  
 Project Manager Review: [Signature] Date: 6.30.17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 01, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

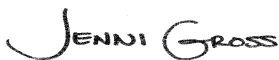
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on September 1, 2017 to update the sample ID for 10393711001 to MW-9D-GW-062617, per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10393711001	MW9D-GW-062617	Water	06/26/17 11:40	06/27/17 09:30
10393711002	Thorson-GW-062617	Water	06/26/17 12:40	06/27/17 09:30
10393711003	Marlow #2-GW-062617	Water	06/26/17 15:00	06/27/17 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393711001	MW9D-GW-062617	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-M
		EPA 300.0	KEO	3	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-M
10393711002	Thorson-GW-062617	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-M
		EPA 300.0	KEO	3	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-M
10393711003	Marlow #2-GW-062617	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-M
		EPA 300.0	KEO	3	PASI-M
		SM 3500-Cr D Modified	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10393711001</b>	<b>MW9D-GW-062617</b>					
RSK 175	Methane	1.5J	ug/L	10.0	06/28/17 09:52	
6010C Met	Aluminum, Dissolved	11.5J	ug/L	200	07/06/17 16:47	
6010C Met	Arsenic, Dissolved	6.8J	ug/L	20.0	07/06/17 16:47	
6010C Met	Barium, Dissolved	62.1	ug/L	10.0	07/06/17 16:47	
6010C Met	Calcium, Dissolved	50500	ug/L	500	07/06/17 16:47	
6010C Met	Copper, Dissolved	2.0J	ug/L	10.0	07/06/17 16:47	
6010C Met	Magnesium, Dissolved	14400	ug/L	500	07/06/17 16:47	
6010C Met	Manganese, Dissolved	10.9	ug/L	5.0	07/06/17 16:47	
6010C Met	Potassium, Dissolved	2220J	ug/L	2500	07/06/17 16:47	
6010C Met	Sodium, Dissolved	14600	ug/L	1000	07/06/17 16:47	
6010C Met	Thallium, Dissolved	6.4J	ug/L	20.0	07/06/17 16:47	
6010C Met	Vanadium, Dissolved	6.2J	ug/L	15.0	07/06/17 16:47	
6010C Met	Zinc, Dissolved	3.2J	ug/L	20.0	07/06/17 16:47	
SM 2320B	Alkalinity, Total as CaCO3	162	mg/L	5.0	06/29/17 13:13	
SM 2540C	Total Dissolved Solids	319	mg/L	10.0	06/28/17 09:03	
EPA 300.0	Chloride	12.0	mg/L	1.2	06/27/17 12:56	
EPA 300.0	Nitrate as N	4.4	mg/L	0.10	06/27/17 12:56	
EPA 300.0	Sulfate	35.5	mg/L	1.2	06/27/17 12:56	
SM 3500-Cr D Modified	Chromium, Hexavalent	0.0086J	mg/L	0.010	06/27/17 12:39	B, H1
EPA 353.2	Nitrogen, NO2 plus NO3	4.0	mg/L	0.10	06/29/17 13:10	
SM 5310C	Total Organic Carbon	0.61J	mg/L	1.0	07/11/17 04:05	
<b>10393711002</b>	<b>Thorson-GW-062617</b>					
RSK 175	Methane	1.7J	ug/L	10.0	06/28/17 10:00	
6010C Met	Barium, Dissolved	79.9	ug/L	10.0	07/06/17 16:49	
6010C Met	Calcium, Dissolved	23700	ug/L	500	07/06/17 16:49	
6010C Met	Copper, Dissolved	4.5J	ug/L	10.0	07/06/17 16:49	
6010C Met	Iron, Dissolved	98.8	ug/L	50.0	07/06/17 16:49	
6010C Met	Magnesium, Dissolved	12100	ug/L	500	07/06/17 16:49	
6010C Met	Manganese, Dissolved	27.2	ug/L	5.0	07/06/17 16:49	
6010C Met	Potassium, Dissolved	3850	ug/L	2500	07/06/17 16:49	
6010C Met	Sodium, Dissolved	14700	ug/L	1000	07/06/17 16:49	
6010C Met	Zinc, Dissolved	11.2J	ug/L	20.0	07/06/17 16:49	
SM 2320B	Alkalinity, Total as CaCO3	146	mg/L	5.0	06/29/17 13:27	
SM 2540C	Total Dissolved Solids	185	mg/L	10.0	06/30/17 09:47	
EPA 300.0	Chloride	1.2	mg/L	1.2	06/27/17 13:12	
EPA 300.0	Sulfate	3.2	mg/L	1.2	06/27/17 13:12	B
SM 3500-Cr D Modified	Chromium, Hexavalent	0.0033J	mg/L	0.010	06/27/17 12:39	B
<b>10393711003</b>	<b>Marlow #2-GW-062617</b>					
RSK 175	Methane	2.2J	ug/L	10.0	06/28/17 10:07	
6010C Met	Barium, Dissolved	43.6	ug/L	10.0	07/06/17 16:52	
6010C Met	Calcium, Dissolved	38800	ug/L	500	07/06/17 16:52	
6010C Met	Copper, Dissolved	1.7J	ug/L	10.0	07/06/17 16:52	
6010C Met	Magnesium, Dissolved	10600	ug/L	500	07/06/17 16:52	
6010C Met	Manganese, Dissolved	56.0	ug/L	5.0	07/06/17 16:52	
6010C Met	Potassium, Dissolved	836J	ug/L	2500	07/06/17 16:52	
6010C Met	Sodium, Dissolved	13800	ug/L	1000	07/06/17 16:52	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393711003</b>	<b>Marlow #2-GW-062617</b>					
6010C Met	Thallium, Dissolved	6.0J	ug/L	20.0	07/06/17 16:52	
6010C Met	Vanadium, Dissolved	0.64J	ug/L	15.0	07/06/17 16:52	
6010C Met	Zinc, Dissolved	11.1J	ug/L	20.0	07/06/17 16:52	
SM 2320B	Alkalinity, Total as CaCO3	155	mg/L	5.0	06/29/17 13:31	
SM 2540C	Total Dissolved Solids	193	mg/L	10.0	06/30/17 09:47	
EPA 300.0	Chloride	3.9	mg/L	1.2	06/27/17 13:27	
EPA 300.0	Nitrate as N	0.38	mg/L	0.10	06/27/17 13:27	
EPA 300.0	Sulfate	13.2	mg/L	1.2	06/27/17 13:27	
EPA 353.2	Nitrogen, NO2 plus NO3	0.38	mg/L	0.020	06/29/17 12:32	
SM 5310C	Total Organic Carbon	3.2	mg/L	1.0	07/11/17 04:32	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482415

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393443002,10393845001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2627676)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 83693

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2056918001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 356545)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 481817

B: Analyte was detected in the associated method blank.

- BLANK for HBN 481817 [WETA/316 (Lab ID: 2624574)
- Sulfate

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481817

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393658001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2624576)
  - Chloride
- MSD (Lab ID: 2624577)
  - Chloride

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** SM 3500-Cr D Modified

**Description:** Chromium, Hexavalent

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

### General Information:

3 samples were analyzed for SM 3500-Cr D Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW9D-GW-062617 (Lab ID: 10393711001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 481919

B: Analyte was detected in the associated method blank.

- BLANK for HBN 481919 [WETA/316 (Lab ID: 2624955)
- Chromium, Hexavalent

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 481919

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10393711003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2624957)
  - Chromium, Hexavalent
- MSD (Lab ID: 2624958)
  - Chromium, Hexavalent

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 482462

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2627870)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2627871)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482649

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10394020001,10394020002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2629157)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2629159)
  - Chemical Oxygen Demand

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** September 01, 2017

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

**Sample: MW9D-GW-062617**      **Lab ID: 10393711001**      Collected: 06/26/17 11:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/28/17 09:52	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/28/17 09:52	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		06/28/17 09:52	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	11.5J	ug/L	200	8.6	1	07/06/17 11:04	07/06/17 16:47	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/06/17 11:04	07/06/17 16:47	7440-36-0	
Arsenic, Dissolved	6.8J	ug/L	20.0	5.2	1	07/06/17 11:04	07/06/17 16:47	7440-38-2	
Barium, Dissolved	62.1	ug/L	10.0	0.22	1	07/06/17 11:04	07/06/17 16:47	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/06/17 11:04	07/06/17 16:47	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/06/17 11:04	07/06/17 16:47	7440-43-9	
Calcium, Dissolved	50500	ug/L	500	24.7	1	07/06/17 11:04	07/06/17 16:47	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/06/17 11:04	07/06/17 16:47	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/06/17 11:04	07/06/17 16:47	7440-48-4	
Copper, Dissolved	2.0J	ug/L	10.0	0.83	1	07/06/17 11:04	07/06/17 16:47	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/06/17 11:04	07/06/17 16:47	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/06/17 11:04	07/06/17 16:47	7439-92-1	
Magnesium, Dissolved	14400	ug/L	500	2.6	1	07/06/17 11:04	07/06/17 16:47	7439-95-4	
Manganese, Dissolved	10.9	ug/L	5.0	0.38	1	07/06/17 11:04	07/06/17 16:47	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/06/17 11:04	07/06/17 16:47	7440-02-0	
Potassium, Dissolved	2220J	ug/L	2500	126	1	07/06/17 11:04	07/06/17 16:47	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/06/17 11:04	07/06/17 16:47	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/06/17 11:04	07/06/17 16:47	7440-22-4	
Sodium, Dissolved	14600	ug/L	1000	44.6	1	07/06/17 11:04	07/06/17 16:47	7440-23-5	
Thallium, Dissolved	6.4J	ug/L	20.0	4.8	1	07/06/17 11:04	07/06/17 16:47	7440-28-0	
Vanadium, Dissolved	6.2J	ug/L	15.0	0.42	1	07/06/17 11:04	07/06/17 16:47	7440-62-2	
Zinc, Dissolved	3.2J	ug/L	20.0	1.8	1	07/06/17 11:04	07/06/17 16:47	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/06/17 09:33	07/06/17 12:53	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	162	mg/L	5.0	1.4	1		06/29/17 13:13		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	319	mg/L	10.0	5.0	1		06/28/17 09:03		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/29/17 16:40		
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	12.0	mg/L	1.2	0.10	1		06/27/17 12:56	16887-00-6	
Nitrate as N	4.4	mg/L	0.10	0.013	1		06/27/17 12:56	14797-55-8	
Sulfate	35.5	mg/L	1.2	0.16	1		06/27/17 12:56	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

**Sample: MW9D-GW-062617**      **Lab ID: 10393711001**      Collected: 06/26/17 11:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Chromium, Hexavalent</b>	Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	<b>0.0086J</b>	mg/L	0.010	0.0021	1		06/27/17 12:39		B,H1
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.0</b>	mg/L	0.10	0.037	5		06/29/17 13:10		
<b>410.4 COD</b>	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/05/17 12:51	07/06/17 12:39		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.61J</b>	mg/L	1.0	0.20	1		07/11/17 04:05	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

**Sample: Thorson-GW-062617**      **Lab ID: 10393711002**      Collected: 06/26/17 12:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		06/28/17 10:00	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/28/17 10:00	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		06/28/17 10:00	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/06/17 11:04	07/06/17 16:49	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/06/17 11:04	07/06/17 16:49	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/06/17 11:04	07/06/17 16:49	7440-38-2	
Barium, Dissolved	79.9	ug/L	10.0	0.22	1	07/06/17 11:04	07/06/17 16:49	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/06/17 11:04	07/06/17 16:49	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/06/17 11:04	07/06/17 16:49	7440-43-9	
Calcium, Dissolved	23700	ug/L	500	24.7	1	07/06/17 11:04	07/06/17 16:49	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/06/17 11:04	07/06/17 16:49	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/06/17 11:04	07/06/17 16:49	7440-48-4	
Copper, Dissolved	4.5J	ug/L	10.0	0.83	1	07/06/17 11:04	07/06/17 16:49	7440-50-8	
Iron, Dissolved	98.8	ug/L	50.0	16.7	1	07/06/17 11:04	07/06/17 16:49	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/06/17 11:04	07/06/17 16:49	7439-92-1	
Magnesium, Dissolved	12100	ug/L	500	2.6	1	07/06/17 11:04	07/06/17 16:49	7439-95-4	
Manganese, Dissolved	27.2	ug/L	5.0	0.38	1	07/06/17 11:04	07/06/17 16:49	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/06/17 11:04	07/06/17 16:49	7440-02-0	
Potassium, Dissolved	3850	ug/L	2500	126	1	07/06/17 11:04	07/06/17 16:49	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/06/17 11:04	07/06/17 16:49	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/06/17 11:04	07/06/17 16:49	7440-22-4	
Sodium, Dissolved	14700	ug/L	1000	44.6	1	07/06/17 11:04	07/06/17 16:49	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	07/06/17 11:04	07/06/17 16:49	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	07/06/17 11:04	07/06/17 16:49	7440-62-2	
Zinc, Dissolved	11.2J	ug/L	20.0	1.8	1	07/06/17 11:04	07/06/17 16:49	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/06/17 09:33	07/06/17 12:55	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	146	mg/L	5.0	1.4	1		06/29/17 13:27		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	185	mg/L	10.0	5.0	1		06/30/17 09:47		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/29/17 16:40		
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.2	mg/L	1.2	0.10	1		06/27/17 13:12	16887-00-6	
Nitrate as N	<0.013	mg/L	0.10	0.013	1		06/27/17 13:12	14797-55-8	
Sulfate	3.2	mg/L	1.2	0.16	1		06/27/17 13:12	14808-79-8	B

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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**Sample: Thorson-GW-062617**      **Lab ID: 10393711002**      Collected: 06/26/17 12:40      Received: 06/27/17 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Chromium, Hexavalent</b>	Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	<b>0.0033J</b>	mg/L	0.010	0.0021	1		06/27/17 12:39		B
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		06/29/17 12:31		
<b>410.4 COD</b>	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/05/17 12:51	07/06/17 12:40		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		07/11/17 04:18	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

**Sample: Marlow #2-GW-062617**      **Lab ID: 10393711003**      Collected: 06/26/17 15:00      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		06/28/17 10:07	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		06/28/17 10:07	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		06/28/17 10:07	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/06/17 11:04	07/06/17 16:52	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/06/17 11:04	07/06/17 16:52	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/06/17 11:04	07/06/17 16:52	7440-38-2	
Barium, Dissolved	43.6	ug/L	10.0	0.22	1	07/06/17 11:04	07/06/17 16:52	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/06/17 11:04	07/06/17 16:52	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/06/17 11:04	07/06/17 16:52	7440-43-9	
Calcium, Dissolved	38800	ug/L	500	24.7	1	07/06/17 11:04	07/06/17 16:52	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/06/17 11:04	07/06/17 16:52	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/06/17 11:04	07/06/17 16:52	7440-48-4	
Copper, Dissolved	1.7J	ug/L	10.0	0.83	1	07/06/17 11:04	07/06/17 16:52	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/06/17 11:04	07/06/17 16:52	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/06/17 11:04	07/06/17 16:52	7439-92-1	
Magnesium, Dissolved	10600	ug/L	500	2.6	1	07/06/17 11:04	07/06/17 16:52	7439-95-4	
Manganese, Dissolved	56.0	ug/L	5.0	0.38	1	07/06/17 11:04	07/06/17 16:52	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/06/17 11:04	07/06/17 16:52	7440-02-0	
Potassium, Dissolved	836J	ug/L	2500	126	1	07/06/17 11:04	07/06/17 16:52	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/06/17 11:04	07/06/17 16:52	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/06/17 11:04	07/06/17 16:52	7440-22-4	
Sodium, Dissolved	13800	ug/L	1000	44.6	1	07/06/17 11:04	07/06/17 16:52	7440-23-5	
Thallium, Dissolved	6.0J	ug/L	20.0	4.8	1	07/06/17 11:04	07/06/17 16:52	7440-28-0	
Vanadium, Dissolved	0.64J	ug/L	15.0	0.42	1	07/06/17 11:04	07/06/17 16:52	7440-62-2	
Zinc, Dissolved	11.1J	ug/L	20.0	1.8	1	07/06/17 11:04	07/06/17 16:52	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/06/17 09:33	07/06/17 12:57	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	155	mg/L	5.0	1.4	1		06/29/17 13:31		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	193	mg/L	10.0	5.0	1		06/30/17 09:47		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		06/29/17 16:40		
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.9	mg/L	1.2	0.10	1		06/27/17 13:27	16887-00-6	
Nitrate as N	0.38	mg/L	0.10	0.013	1		06/27/17 13:27	14797-55-8	
Sulfate	13.2	mg/L	1.2	0.16	1		06/27/17 13:27	14808-79-8	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

**Sample: Marlow #2-GW-062617**      **Lab ID: 10393711003**      Collected: 06/26/17 15:00      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Chromium, Hexavalent</b>	Analytical Method: SM 3500-Cr D Modified								
Chromium, Hexavalent	<b>&lt;0.0021</b>	mg/L	0.010	0.0021	1		06/27/17 12:39		M1
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.38</b>	mg/L	0.020	0.0075	1		06/29/17 12:32		
<b>410.4 COD</b>	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/05/17 12:51	07/06/17 12:40		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.2</b>	mg/L	1.0	0.20	1		07/11/17 04:32	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 482086 Analysis Method: RSK 175  
 QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2625787 Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	06/28/17 08:59	
Ethene	ug/L	<0.68	10.0	0.68	06/28/17 08:59	
Methane	ug/L	1.6J	10.0	1.1	06/28/17 08:59	

LABORATORY CONTROL SAMPLE & LCSD: 2625788

2625789

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	105	109	92	96	85-115	4	20	
Ethene	ug/L	106	99.6	103	94	97	85-115	3	20	
Methane	ug/L	60.7	57.2	58.9	94	97	85-115	3	20	

SAMPLE DUPLICATE: 2625790

Parameter	Units	35320066013 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	7.2J	7.9J		20	
Ethene	ug/L	2.1J	2.2J		20	
Methane	ug/L	505	565	11	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 482065

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2625703

Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	07/06/17 12:46	

LABORATORY CONTROL SAMPLE & LCSD: 2625704

2632571

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Mercury, Dissolved	ug/L	5	5.5	5.7	111	114	80-120	3	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 482057 Analysis Method: 6010C Met  
 QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
 Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2625671 Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	07/06/17 16:36	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	07/06/17 16:36	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	07/06/17 16:36	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	07/06/17 16:36	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	07/06/17 16:36	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	07/06/17 16:36	
Calcium, Dissolved	ug/L	<24.7	500	24.7	07/06/17 16:36	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	07/06/17 16:36	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	07/06/17 16:36	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	07/06/17 16:36	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	07/06/17 16:36	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	07/06/17 16:36	
Magnesium, Dissolved	ug/L	3.0J	500	2.6	07/06/17 16:36	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	07/06/17 16:36	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	07/06/17 16:36	
Potassium, Dissolved	ug/L	<126	2500	126	07/06/17 16:36	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	07/06/17 16:36	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	07/06/17 16:36	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	07/06/17 16:36	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	07/06/17 16:36	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	07/06/17 16:36	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	07/06/17 16:36	

LABORATORY CONTROL SAMPLE & LCSD: 2625672 2632570

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aluminum, Dissolved	ug/L	20000	20900	20800	105	104	80-120	0	20	
Antimony, Dissolved	ug/L	1000	997	1000	100	100	80-120	1	20	
Arsenic, Dissolved	ug/L	1000	985	982	98	98	80-120	0	20	
Barium, Dissolved	ug/L	1000	996	992	100	99	80-120	0	20	
Beryllium, Dissolved	ug/L	1000	1000	999	100	100	80-120	0	20	
Cadmium, Dissolved	ug/L	1000	984	980	98	98	80-120	0	20	
Calcium, Dissolved	ug/L	20000	18700	18700	94	93	80-120	0	20	
Chromium, Dissolved	ug/L	1000	979	978	98	98	80-120	0	20	
Cobalt, Dissolved	ug/L	1000	979	977	98	98	80-120	0	20	
Copper, Dissolved	ug/L	1000	976	973	98	97	80-120	0	20	
Iron, Dissolved	ug/L	20000	19700	19800	99	99	80-120	0	20	
Lead, Dissolved	ug/L	1000	992	989	99	99	80-120	0	20	
Magnesium, Dissolved	ug/L	20000	19500	19500	98	98	80-120	0	20	
Manganese, Dissolved	ug/L	1000	997	995	100	99	80-120	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

Parameter	Units	LABORATORY CONTROL SAMPLE & LCSD: 2625672		2632570			% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec				
Nickel, Dissolved	ug/L	1000	990	989	99	99	80-120	0	20	
Potassium, Dissolved	ug/L	20000	19600	19500	98	98	80-120	0	20	
Selenium, Dissolved	ug/L	1000	1040	1040	104	104	80-120	0	20	
Silver, Dissolved	ug/L	500	482	481	96	96	80-120	0	20	
Sodium, Dissolved	ug/L	20000	19400	19400	97	97	80-120	0	20	
Thallium, Dissolved	ug/L	1000	999	993	100	99	80-120	1	20	
Vanadium, Dissolved	ug/L	1000	952	949	95	95	80-120	0	20	
Zinc, Dissolved	ug/L	1000	965	964	97	96	80-120	0	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

QC Batch: 482415 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2627670 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	06/29/17 10:52	

LABORATORY CONTROL SAMPLE & LCSD: 2627671 2627672

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	42.4	42.3	106	106	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627673 2627674

Parameter	Units	10393443002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	285	40	40	327	318	104	82	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627675 2627676

Parameter	Units	10393845001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	295	40	40	340	350	111	138	80-120	3	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 482084

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10393711001

METHOD BLANK: 2625781

Matrix: Water

Associated Lab Samples: 10393711001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/28/17 09:03	

LABORATORY CONTROL SAMPLE: 2625782

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	976	98	80-120	

SAMPLE DUPLICATE: 2625783

Parameter	Units	10393843001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1810	1880	4	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 482651

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10393711002, 10393711003

METHOD BLANK: 2629164

Matrix: Water

Associated Lab Samples: 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	06/30/17 09:47	

LABORATORY CONTROL SAMPLE: 2629165

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	938	94	80-120	

SAMPLE DUPLICATE: 2629166

Parameter	Units	10394141004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	168	171	2	10	

SAMPLE DUPLICATE: 2629167

Parameter	Units	10394141005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	131	131	0	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 83693

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 356515

Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	06/29/17 16:39	

LABORATORY CONTROL SAMPLE: 356516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	106	90-110	

MATRIX SPIKE SAMPLE: 356545

Parameter	Units	2056918001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.045	22	75-125	M1

SAMPLE DUPLICATE: 356544

Parameter	Units	2056918001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

QC Batch: 481817 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2624574 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	06/27/17 09:17	
Nitrate as N	mg/L	<0.013	0.10	0.013	06/27/17 09:17	
Sulfate	mg/L	0.39J	1.2	0.16	06/27/17 09:17	

LABORATORY CONTROL SAMPLE: 2624575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.7	102	90-110	
Nitrate as N	mg/L	1	0.99	99	90-110	
Sulfate	mg/L	12.5	12.3	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2624576 2624577

Parameter	Units	10393658001		MSD		MS		MSD		% Rec Limits	Max		Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MSD Result	% Rec	% Rec	RPD		RPD		
Chloride	mg/L	581	125	125	668	670	70	72	90-110	0	20	M6	
Nitrate as N	mg/L	ND	1	1	1.0	1.0	96	96	90-110	0	20		
Sulfate	mg/L	173	125	125	290	291	94	95	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

QC Batch: 481919

Analysis Method: SM 3500-Cr D Modified

QC Batch Method: SM 3500-Cr D Modified

Analysis Description: Chromium, Hexavalent by 3500

Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2624955

Matrix: Water

Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chromium, Hexavalent	mg/L	0.0042J	0.010	0.0021	06/27/17 12:39	

LABORATORY CONTROL SAMPLE: 2624956

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/L	.2	0.19	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2624957 2624958

Parameter	Units	2624957		2624958		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10393711003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chromium, Hexavalent	mg/L	<0.0021	.2	.2	0.15	0.15	77	74	85-115	4	20 M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

QC Batch: 482462 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2627866 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	06/29/17 12:41	FS

LABORATORY CONTROL SAMPLE: 2627867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.94	94	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627868 2627869

Parameter	Units	10393443001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	0.84	1	1	1.8	1.8	96	99	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2627870 2627871

Parameter	Units	10393443002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	1.4	1	1	2.3	2.3	91	92	90-110	0	20	E

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

QC Batch: 482649 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 2629154 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	07/06/17 12:36	

LABORATORY CONTROL SAMPLE: 2629155

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	302	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629156 2629157

Parameter	Units	10394020001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chemical Oxygen Demand	mg/L	1020	250	1260	250	1250	94	89	90-110	1	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629158 2629159

Parameter	Units	10394020002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Chemical Oxygen Demand	mg/L	1150	250	1380	250	1370	91	88	90-110	0	20	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

QC Batch: 118819 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

METHOD BLANK: 470457 Matrix: Water  
Associated Lab Samples: 10393711001, 10393711002, 10393711003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	07/11/17 01:14	

LABORATORY CONTROL SAMPLE: 470458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 470459 470460

Parameter	Units	10394667001 Result	MS		MSD		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Total Organic Carbon	mg/L	294	250	250	556	541	105	99	80-120	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 470461 470462

Parameter	Units	10394025004 Result	MS		MSD		% Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Total Organic Carbon	mg/L	2.5	25	25	29.6	29.6	108	109	80-120	0	20	

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## QUALIFIERS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393711

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393711

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10393711001	MW9D-GW-062617	RSK 175	482086		
10393711002	Thorson-GW-062617	RSK 175	482086		
10393711003	Marlow #2-GW-062617	RSK 175	482086		
10393711001	MW9D-GW-062617	EPA 3010	482057	6010C Met	483526
10393711002	Thorson-GW-062617	EPA 3010	482057	6010C Met	483526
10393711003	Marlow #2-GW-062617	EPA 3010	482057	6010C Met	483526
10393711001	MW9D-GW-062617	EPA 7470A	482065	EPA 7470A	483468
10393711002	Thorson-GW-062617	EPA 7470A	482065	EPA 7470A	483468
10393711003	Marlow #2-GW-062617	EPA 7470A	482065	EPA 7470A	483468
10393711001	MW9D-GW-062617	SM 2320B	482415		
10393711002	Thorson-GW-062617	SM 2320B	482415		
10393711003	Marlow #2-GW-062617	SM 2320B	482415		
10393711001	MW9D-GW-062617	SM 2540C	482084		
10393711002	Thorson-GW-062617	SM 2540C	482651		
10393711003	Marlow #2-GW-062617	SM 2540C	482651		
10393711001	MW9D-GW-062617	SM 4500-S-2 D	83693		
10393711002	Thorson-GW-062617	SM 4500-S-2 D	83693		
10393711003	Marlow #2-GW-062617	SM 4500-S-2 D	83693		
10393711001	MW9D-GW-062617	EPA 300.0	481817		
10393711002	Thorson-GW-062617	EPA 300.0	481817		
10393711003	Marlow #2-GW-062617	EPA 300.0	481817		
10393711001	MW9D-GW-062617	SM 3500-Cr D Modified	481919		
10393711002	Thorson-GW-062617	SM 3500-Cr D Modified	481919		
10393711003	Marlow #2-GW-062617	SM 3500-Cr D Modified	481919		
10393711001	MW9D-GW-062617	EPA 353.2	482462		
10393711002	Thorson-GW-062617	EPA 353.2	482462		
10393711003	Marlow #2-GW-062617	EPA 353.2	482462		
10393711001	MW9D-GW-062617	EPA 410.4	482649	EPA 410.4	483512
10393711002	Thorson-GW-062617	EPA 410.4	482649	EPA 410.4	483512
10393711003	Marlow #2-GW-062617	EPA 410.4	482649	EPA 410.4	483512
10393711001	MW9D-GW-062617	SM 5310C	118819		
10393711002	Thorson-GW-062617	SM 5310C	118819		
10393711003	Marlow #2-GW-062617	SM 5310C	118819		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10393711

**Section A**

**Required Client Information:**

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2n.com  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date/Circle: 24 Hour / 5 Day / 10 Day

**Section B**

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #: \_\_\_\_\_  
 Project Name: UPRR\_Freeman  
 Project #: 1497

**Section C**

**Invoice Information:**

Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: \_\_\_\_\_  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447

Page: 1 Of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	CODE Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analyzes Test Y/N	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)		
					START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	VOCs by 8260	Dep.Weight		TAL	METALS	Cr6	Fe2+	COD	BOD	CI, SD4, NITRATE	SULFIDE	AIK	TOC		TDS	MEE P&K 175
					DATE	TIME	DATE	TIME																										
1	MW19D-GW-062617	WT	D	G			6/26/17	1140	10	4	4	1	1					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	CO1	
2	THORSON-GW-062617	WT	G	G			6/26/17	1240	10	4	4	1	1					X	X	X	X	X	X	X	X	X	X	X	X	X	X	CO2		
3	MARLOW#2-GW-062617	WT	G	G			6/26/17	1500	10	4	4	1	1					X	X	X	X	X	X	X	X	X	X	X	X	X	X	CO3		
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
	REBECC GREEN CLERM	6/26/17	1700	ED EX M... pace	6/26/17	1700	0.8	Y	Y	Y	

THIS CHAIN OF CUSTODY INDIVIDUAL REPORT

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: REBECC GREEN

SIGNATURE of SAMPLER: [Signature]

DATE Signed: 6/26/17

TEMP in C


Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

**Sample Condition Upon Receipt - ESI Tech Specs**      **Client Name:** UPRR CH2M HILL      **Project #:** \_\_\_\_\_

WO#: 10393711



10393711

**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_

**Tracking Number:** 7096 33718841

**Custody Seal on Cooler/Box Present?**  Yes     No      **Seals Intact?**  Yes     No

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**  Yes     No

**Thermometer Used:**  151401163     151401164      **Type of Ice:**  Wet     Blue     None     Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 0.7      **Cooler Temp Corrected (°C):** 0.8      **Biological Tissue Frozen?**  Yes     No     N/A

Temp should be above freezing to 6°C      **Correction Factor:** 10.1      **Date and Initials of Person Examining Contents:** ME 6-27-17

**USDA Regulated Soil**  N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH      Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-3 1/1    1/1    1/1</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____      Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**  Yes     No

Person Contacted: Lindsey Baumann      Date/Time: 06/27/17 11:52 via email/phone

Comments/Resolution: Per Lindsey, Cr+6, ferrous iron and BOD are not required. Added

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	nitrate+nitrite by 353.2.
Opened Time: <u>1012</u> Temp: <u>0.7</u> Corrected Temp: <u>0.8</u>	
Time: _____    put in cooler	
Time: <u>1023</u> Temp: _____    Corrected Temp: _____	

**Project Manager Review:** JENNI GROSS      **Date:** 06/27/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody \_\_\_\_\_

WO#: 2056876



2056876 Owner Received Date: 07/27/2017 Results Requested By: 7/12/2017

Workorder: 10393711 Workorder Name: 1497 UPRR\_Freeman

Report To		Subcontract To		Requested Analysis															
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																	
						Preserved Containers													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other													LAB USE ONLY
1	MW19D-GW-062617	PS	6/26/2017 11:40	10393711001	Water	1								X					
2	Thorson-GW-062617	PS	6/26/2017 12:40	10393711002	Water	1								X					
3	Marlow #2-GW-062617	PS	6/26/2017 15:00	10393711003	Water	1								X					
4																			
5																			

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i> Pace MN	6/27/17 1345			
2		6-28-17 0830	<i>[Signature]</i> Pace	6-28-17 0830	
3					

Cooler Temperature on Receipt 2-3°C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon F

Proj \_\_\_\_\_

# WO#: 2056876

PM: CMM

Due Date: 07/12/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 06-28-17 AP

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

**WO#: 1290621**

PM: HRZ      Due Date: 07/12/17  
 CLIENT: PACE MPLS

Page 43 of 44

Workorder: 10393711

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 6/27/2017 Results Requested By:

Report To	Subcontract To	Requested Analysis
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042	5632354 / 5310 TOC

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				LAB USE ONLY
						H2SO4				
1	MW19D-GW-062617	PS	6/26/2017 11:40	10393711001	Water	3				X
2	Thorson-GW-062617	PS	6/26/2017 12:40	10393711002	Water	3				X
3	Marlow #2-GW-062617	PS	6/26/2017 15:00	10393711003	Water	3				X
4										
5										

					Comments
Transfers	Released By	Date/Time	Received By	Date/Time	
1	<i>[Signature]</i> Pace MN	6/27/17 1340	<i>[Signature]</i>	6/28/17 1435	
2	<i>[Signature]</i>	6/29/17 2220	<i>[Signature]</i>	6/29 0800	
3					

Cooler Temperature on Receipt 1.7 °C      Custody Seal Y or N      Received on Ice Y or N      Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.





Document Name:  
**Sample Condition Upon Receipt Form**  
 Document No.:  
 F-VM-C-001-Rev.10

Document Revised: 15Mar2016  
 Page 1 of 1  
 Issuing Authority:  
 Pace Virginia, Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: Pace Milk Project #: \_\_\_\_\_

**WO#: 1290621**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read °C: 1.4 Cooler Temp Corrected °C: 1.7 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: PLC 6/28/17  
 Comments: WV 6/29/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N  
 Project Manager Review: [Signature] Date: 6.30.17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 07, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393713

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

---

<b>Lab ID</b>	<b>Sample ID</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Date Received</b>
10393713001	Marlow #2-GW-062617	Water	06/26/17 15:00	06/27/17 09:30

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

---

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393713001	Marlow #2-GW-062617	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393713001</b>	<b>Marlow #2-GW-062617</b>					
EPA 8260B	Acetone	28.0	ug/L	20.0	06/30/17 17:12	CH,L1
EPA 8260B	Carbon tetrachloride	1.1	ug/L	0.50	06/30/17 17:12	
EPA 8260B	Chloroform	1.1	ug/L	1.0	06/30/17 17:12	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 07, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 482682

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- DUP (Lab ID: 2629245)
  - Acetone
- LCS (Lab ID: 2629242)
  - Acetone
- LCSD (Lab ID: 2629243)
  - Acetone
- MS (Lab ID: 2629244)
  - Acetone
- Marlow #2-GW-062617 (Lab ID: 10393713001)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 482682

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2629242)
  - Acetone
- LCSD (Lab ID: 2629243)
  - Acetone

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 07, 2017

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482682

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

Sample: Marlow #2-GW-062617 Lab ID: 10393713001 Collected: 06/26/17 15:00 Received: 06/27/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/30/17 17:12	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/30/17 17:12	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/30/17 17:12	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/30/17 17:12	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/30/17 17:12	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/30/17 17:12	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/30/17 17:12	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/30/17 17:12	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/30/17 17:12	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/30/17 17:12	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/30/17 17:12	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/30/17 17:12	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/30/17 17:12	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/30/17 17:12	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/30/17 17:12	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/30/17 17:12	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/30/17 17:12	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/30/17 17:12	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/30/17 17:12	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/30/17 17:12	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/30/17 17:12	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/30/17 17:12	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/30/17 17:12	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/30/17 17:12	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/30/17 17:12	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/30/17 17:12	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/30/17 17:12	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/30/17 17:12	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/30/17 17:12	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/30/17 17:12	108-10-1	
Acetone	28.0	ug/L	20.0	0.64	1		06/30/17 17:12	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/30/17 17:12	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/30/17 17:12	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/30/17 17:12	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/30/17 17:12	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/30/17 17:12	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/30/17 17:12	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/30/17 17:12	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/30/17 17:12	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/30/17 17:12	75-15-0	
Carbon tetrachloride	1.1	ug/L	0.50	0.079	1		06/30/17 17:12	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/30/17 17:12	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/30/17 17:12	75-00-3	
Chloroform	1.1	ug/L	1.0	0.21	1		06/30/17 17:12	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/30/17 17:12	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/30/17 17:12	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

**Sample: Marlow #2-GW-062617**      **Lab ID: 10393713001**      Collected: 06/26/17 15:00      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/30/17 17:12	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/30/17 17:12	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/30/17 17:12	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/30/17 17:12	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/30/17 17:12	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/30/17 17:12	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/30/17 17:12	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/30/17 17:12	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/30/17 17:12	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/30/17 17:12	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/30/17 17:12	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/30/17 17:12	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/30/17 17:12	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/30/17 17:12	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/30/17 17:12	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/30/17 17:12	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/30/17 17:12	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/30/17 17:12	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/30/17 17:12	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/30/17 17:12	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/30/17 17:12	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/30/17 17:12	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/30/17 17:12	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/30/17 17:12	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/30/17 17:12	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/30/17 17:12	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/30/17 17:12	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/30/17 17:12	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/30/17 17:12	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/30/17 17:12	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/30/17 17:12	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/30/17 17:12	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/30/17 17:12	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/30/17 17:12	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		06/30/17 17:12	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		06/30/17 17:12	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/30/17 17:12	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393713

QC Batch: 482682 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10393713001

METHOD BLANK: 2629241 Matrix: Water  
Associated Lab Samples: 10393713001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/30/17 10:41	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/30/17 10:41	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/30/17 10:41	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/30/17 10:41	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/30/17 10:41	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/30/17 10:41	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/30/17 10:41	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/30/17 10:41	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/30/17 10:41	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/30/17 10:41	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/30/17 10:41	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/30/17 10:41	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/30/17 10:41	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/30/17 10:41	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/30/17 10:41	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/30/17 10:41	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/30/17 10:41	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/30/17 10:41	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/30/17 10:41	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/30/17 10:41	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/30/17 10:41	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/30/17 10:41	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/30/17 10:41	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/30/17 10:41	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/30/17 10:41	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/30/17 10:41	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/30/17 10:41	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/30/17 10:41	
Acetone	ug/L	<0.64	20.0	0.64	06/30/17 10:41	
Acrolein	ug/L	<2.1	10.0	2.1	06/30/17 10:41	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/30/17 10:41	
Benzene	ug/L	<0.042	0.50	0.042	06/30/17 10:41	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/30/17 10:41	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/30/17 10:41	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/30/17 10:41	
Bromoform	ug/L	<0.11	4.0	0.11	06/30/17 10:41	
Bromomethane	ug/L	<0.20	4.0	0.20	06/30/17 10:41	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/30/17 10:41	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/30/17 10:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393713

METHOD BLANK: 2629241 Matrix: Water  
Associated Lab Samples: 10393713001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/30/17 10:41	
Chloroethane	ug/L	<0.12	1.0	0.12	06/30/17 10:41	
Chloroform	ug/L	<0.21	1.0	0.21	06/30/17 10:41	
Chloromethane	ug/L	<0.080	4.0	0.080	06/30/17 10:41	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/30/17 10:41	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/30/17 10:41	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/30/17 10:41	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/30/17 10:41	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/30/17 10:41	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/30/17 10:41	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/30/17 10:41	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/30/17 10:41	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/30/17 10:41	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/30/17 10:41	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/30/17 10:41	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/30/17 10:41	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/30/17 10:41	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/30/17 10:41	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/30/17 10:41	
Naphthalene	ug/L	<0.064	1.0	0.064	06/30/17 10:41	
o-Xylene	ug/L	<0.044	0.50	0.044	06/30/17 10:41	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/30/17 10:41	
Styrene	ug/L	<0.056	0.50	0.056	06/30/17 10:41	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/30/17 10:41	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/30/17 10:41	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/30/17 10:41	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/30/17 10:41	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/30/17 10:41	
Toluene	ug/L	<0.059	0.50	0.059	06/30/17 10:41	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/30/17 10:41	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/30/17 10:41	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/30/17 10:41	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/30/17 10:41	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/30/17 10:41	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/30/17 10:41	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/30/17 10:41	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/30/17 10:41	
1,2-Dichloroethane-d4 (S)	%	106	75-137		06/30/17 10:41	
4-Bromofluorobenzene (S)	%	101	75-125		06/30/17 10:41	
Toluene-d8 (S)	%	101	75-125		06/30/17 10:41	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393713

LABORATORY CONTROL SAMPLE & LCSD: 2629242		2629243								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.0	20.0	110	100	75-136	10	30	
1,1,1-Trichloroethane	ug/L	20	21.2	19.7	106	99	75-129	8	30	
1,1,2,2-Tetrachloroethane	ug/L	20	22.0	20.8	110	104	71-138	6	30	
1,1,2-Trichloroethane	ug/L	20	23.4	21.5	117	108	75-125	8	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	22.0	21.3	110	106	69-126	3	30	
1,1-Dichloroethane	ug/L	20	21.8	20.4	109	102	75-125	6	30	
1,1-Dichloroethene	ug/L	20	22.1	20.8	111	104	75-125	6	30	
1,1-Dichloropropene	ug/L	20	21.5	19.9	108	100	75-125	8	30	
1,2,3-Trichlorobenzene	ug/L	20	19.3	19.8	97	99	75-125	2	30	
1,2,3-Trichloropropane	ug/L	20	21.2	20.4	106	102	75-125	4	30	
1,2,4-Trichlorobenzene	ug/L	20	20.1	19.4	101	97	75-125	4	30	
1,2,4-Trimethylbenzene	ug/L	20	20.4	19.6	102	98	75-125	4	30	
1,2-Dibromo-3-chloropropane	ug/L	50	46.3	42.8	93	86	71-130	8	30	
1,2-Dibromoethane (EDB)	ug/L	20	23.0	21.2	115	106	75-125	8	30	
1,2-Dichlorobenzene	ug/L	20	20.5	19.4	103	97	75-125	6	30	
1,2-Dichloroethane	ug/L	20	22.4	20.3	112	102	70-125	10	30	
1,2-Dichloroethene (Total)	ug/L	40	42.3	39.5	106	99	75-125	7	30	
1,2-Dichloropropane	ug/L	20	21.6	20.7	108	103	75-125	4	30	
1,3,5-Trimethylbenzene	ug/L	20	19.9	19.0	100	95	75-125	5	30	
1,3-Dichlorobenzene	ug/L	20	21.6	20.2	108	101	75-125	7	30	
1,3-Dichloropropane	ug/L	20	22.0	20.4	110	102	75-125	7	30	
1,4-Dichlorobenzene	ug/L	20	20.1	19.0	101	95	75-125	6	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	395	409	99	102	64-140	4	30	
2,2,4-Trimethylpentane	ug/L	20	20.3	20.0	101	100	68-125	1	30	
2,2-Dichloropropane	ug/L	20	22.2	20.6	111	103	70-131	8	30	
2-Butanone (MEK)	ug/L	100	106	99.7	106	100	69-125	6	30	
2-Chlorotoluene	ug/L	20	20.0	19.0	100	95	75-125	5	30	
2-Hexanone	ug/L	100	109	102	109	102	73-129	7	30	
4-Chlorotoluene	ug/L	20	21.3	20.0	107	100	75-125	6	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	97.6	105	98	73-125	7	30	
Acetone	ug/L	100	169	152	169	152	66-126	10	30	CH,L1
Acrolein	ug/L	200	244	229	122	115	56-150	6	30	
Acrylonitrile	ug/L	200	212	196	106	98	68-129	8	30	
Benzene	ug/L	20	20.6	19.4	103	97	75-125	6	30	
Bromobenzene	ug/L	20	21.1	19.8	106	99	75-125	7	30	
Bromochloromethane	ug/L	20	22.6	20.7	113	103	75-126	9	30	
Bromodichloromethane	ug/L	20	23.0	21.3	115	107	75-133	8	30	
Bromoform	ug/L	20	18.1	17.5	91	88	62-142	3	30	
Bromomethane	ug/L	20	12.4	13.7	62	69	34-143	10	30	
Carbon disulfide	ug/L	20	21.5	20.5	107	102	71-125	5	30	
Carbon tetrachloride	ug/L	20	21.2	20.3	106	101	71-145	5	30	
Chlorobenzene	ug/L	20	20.6	19.0	103	95	75-125	8	30	
Chloroethane	ug/L	20	23.3	22.4	117	112	75-125	4	30	
Chloroform	ug/L	20	21.0	19.4	105	97	75-125	8	30	
Chloromethane	ug/L	20	18.2	17.3	91	87	54-125	5	30	
cis-1,2-Dichloroethene	ug/L	20	21.4	19.7	107	98	75-125	8	30	
cis-1,3-Dichloropropene	ug/L	20	21.6	20.4	108	102	75-125	6	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393713

LABORATORY CONTROL SAMPLE & LCSD: 2629242		2629243								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	21.9	20.2	110	101	74-141	8	30	
Dibromomethane	ug/L	20	22.2	20.4	111	102	75-125	8	30	
Dichlorodifluoromethane	ug/L	20	24.5	23.1	122	115	59-130	6	30	
Dichlorofluoromethane	ug/L	20	22.0	21.1	110	106	75-125	4	30	
Diisopropyl ether	ug/L	20	21.3	19.7	106	98	69-125	8	30	
Ethyl-tert-butyl ether	ug/L	20	21.1	19.5	105	97	73-125	8	30	
Ethylbenzene	ug/L	20	19.9	18.9	100	94	75-125	5	30	
Hexachloro-1,3-butadiene	ug/L	20	21.9	20.6	110	103	75-131	6	30	
Isopropylbenzene (Cumene)	ug/L	20	19.9	18.8	100	94	75-125	6	30	
m&p-Xylene	ug/L	40	40.2	38.2	101	95	75-125	5	30	
Methyl-tert-butyl ether	ug/L	20	21.4	20.2	107	101	75-125	6	30	
Methylene Chloride	ug/L	20	21.1	19.6	105	98	73-125	7	30	
n-Butylbenzene	ug/L	20	22.3	21.2	112	106	75-125	5	30	
n-Propylbenzene	ug/L	20	19.7	19.2	98	96	75-125	2	30	
Naphthalene	ug/L	20	17.5	17.8	88	89	74-125	1	30	
o-Xylene	ug/L	20	20.1	19.0	101	95	75-125	6	30	
p-Isopropyltoluene	ug/L	20	21.0	20.0	105	100	75-125	5	30	
sec-Butylbenzene	ug/L	20	19.9	19.6	99	98	75-125	1	30	
Styrene	ug/L	20	20.9	19.4	105	97	75-125	7	30	
tert-Amylmethyl ether	ug/L	20	20.7	19.2	103	96	71-126	8	30	
tert-Butyl Alcohol	ug/L	200	200	210	100	105	69-131	5	30	
tert-Butylbenzene	ug/L	20	19.4	18.5	97	92	75-125	5	30	
Tetrachloroethene	ug/L	20	20.4	19.8	102	99	75-125	3	30	
Tetrahydrofuran	ug/L	200	234	208	117	104	65-127	12	30	
Toluene	ug/L	20	20.8	19.2	104	96	75-125	8	30	
trans-1,2-Dichloroethene	ug/L	20	20.9	19.8	105	99	75-125	6	30	
trans-1,3-Dichloropropene	ug/L	20	21.3	19.8	107	99	75-125	8	30	
trans-1,4-Dichloro-2-butene	ug/L	50	44.2	41.5	88	83	30-150	6	30	
Trichloroethene	ug/L	20	21.2	20.0	106	100	75-125	6	30	
Trichlorofluoromethane	ug/L	20	23.2	22.2	116	111	71-140	4	30	
Vinyl acetate	ug/L	20	25.1	23.2	126	116	68-137	8	30	
Vinyl chloride	ug/L	20	23.1	21.9	116	110	70-125	5	30	
Xylene (Total)	ug/L	60	60.4	57.1	101	95	75-125	5	30	
1,2-Dichloroethane-d4 (S)	%				104	102	75-137			
4-Bromofluorobenzene (S)	%				100	98	75-125			
Toluene-d8 (S)	%				101	101	75-125			

MATRIX SPIKE SAMPLE: 2629244		1290523013	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.1	96	75-137	
1,1,1-Trichloroethane	ug/L	ND	20	19.8	99	75-139	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.8	94	60-142	
1,1,2-Trichloroethane	ug/L	ND	20	19.6	98	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	23.3	117	62-150	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

MATRIX SPIKE SAMPLE: 2629244		1290523013	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	ND	20	19.7	98	70-129	
1,1-Dichloroethene	ug/L	ND	20	22.4	112	67-141	
1,1-Dichloropropene	ug/L	ND	20	20.1	101	64-144	
1,2,3-Trichlorobenzene	ug/L	ND	20	19.2	96	66-139	
1,2,3-Trichloropropane	ug/L	ND	20	17.9	89	69-134	
1,2,4-Trichlorobenzene	ug/L	ND	20	19.6	98	65-138	
1,2,4-Trimethylbenzene	ug/L	ND	20	18.9	94	65-143	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	38.8	78	61-134	
1,2-Dibromoethane (EDB)	ug/L	ND	20	19.5	97	74-129	
1,2-Dichlorobenzene	ug/L	ND	20	18.0	90	68-135	
1,2-Dichloroethane	ug/L	ND	20	18.7	94	73-125	
1,2-Dichloroethene (Total)	ug/L	ND	40	38.5	96	69-134	
1,2-Dichloropropane	ug/L	ND	20	19.3	97	64-130	
1,3,5-Trimethylbenzene	ug/L	ND	20	18.8	94	64-146	
1,3-Dichlorobenzene	ug/L	ND	20	18.9	94	69-135	
1,3-Dichloropropane	ug/L	ND	20	18.5	92	67-128	
1,4-Dichlorobenzene	ug/L	ND	20	18.2	91	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	348	87	58-140	
2,2,4-Trimethylpentane	ug/L	ND	20	26.1	130	48-150	
2,2-Dichloropropane	ug/L	ND	20	20.7	103	50-150	
2-Butanone (MEK)	ug/L	ND	100	80.6	81	58-125	
2-Chlorotoluene	ug/L	ND	20	18.2	91	65-138	
2-Hexanone	ug/L	ND	100	87.5	88	61-134	
4-Chlorotoluene	ug/L	ND	20	18.6	93	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	89.5	89	61-130	
Acetone	ug/L	ND	100	178	178	51-140	CH,M0
Acrolein	ug/L	ND	200	266	133	48-150	
Acrylonitrile	ug/L	ND	200	178	89	55-134	
Benzene	ug/L	ND	20	18.7	94	63-132	
Bromobenzene	ug/L	ND	20	18.6	93	67-138	
Bromochloromethane	ug/L	ND	20	19.5	97	66-138	
Bromodichloromethane	ug/L	ND	20	19.7	99	75-137	
Bromoform	ug/L	ND	20	15.6	78	65-129	
Bromomethane	ug/L	ND	20	14.8	74	41-150	
Carbon disulfide	ug/L	ND	20	21.3	107	72-132	
Carbon tetrachloride	ug/L	ND	20	20.6	103	75-150	
Chlorobenzene	ug/L	ND	20	18.1	91	73-127	
Chloroethane	ug/L	ND	20	23.6	118	74-138	
Chloroform	ug/L	ND	20	18.5	93	74-125	
Chloromethane	ug/L	ND	20	16.4	82	58-129	
cis-1,2-Dichloroethene	ug/L	ND	20	18.7	93	63-135	
cis-1,3-Dichloropropene	ug/L	ND	20	18.4	92	66-129	
Dibromochloromethane	ug/L	ND	20	18.7	94	75-133	
Dibromomethane	ug/L	ND	20	18.1	90	68-134	
Dichlorodifluoromethane	ug/L	ND	20	27.8	139	72-150	
Dichlorofluoromethane	ug/L	ND	20	22.0	110	75-129	
Diisopropyl ether	ug/L	ND	20	18.0	90	62-128	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

MATRIX SPIKE SAMPLE: 2629244		1290523013	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	ND	20	18.0	90	63-132	
Ethylbenzene	ug/L	ND	20	17.7	89	72-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	26.3	132	71-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	18.0	90	70-136	
m&p-Xylene	ug/L	ND	40	35.7	89	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	18.3	92	72-125	
Methylene Chloride	ug/L	ND	20	18.1	91	60-132	
n-Butylbenzene	ug/L	ND	20	23.1	116	60-150	
n-Propylbenzene	ug/L	ND	20	18.7	93	63-142	
Naphthalene	ug/L	ND	20	16.3	81	67-125	
o-Xylene	ug/L	ND	20	17.9	89	60-143	
p-Isopropyltoluene	ug/L	ND	20	21.0	105	64-146	
sec-Butylbenzene	ug/L	ND	20	20.9	104	67-144	
Styrene	ug/L	ND	20	18.4	92	67-136	
tert-Amylmethyl ether	ug/L	ND	20	17.6	88	60-134	
tert-Butyl Alcohol	ug/L	ND	200	182	91	56-146	
tert-Butylbenzene	ug/L	ND	20	18.7	94	68-135	
Tetrachloroethene	ug/L	ND	20	19.0	95	67-148	
Tetrahydrofuran	ug/L	ND	200	259	129	51-141	
Toluene	ug/L	ND	20	18.9	95	61-140	
trans-1,2-Dichloroethene	ug/L	ND	20	19.8	99	62-138	
trans-1,3-Dichloropropene	ug/L	ND	20	18.1	90	67-134	
trans-1,4-Dichloro-2-butene	ug/L	ND	50	37.8	76	30-150	
Trichloroethene	ug/L	ND	20	19.6	98	64-149	
Trichlorofluoromethane	ug/L	ND	20	25.5	127	75-150	
Vinyl acetate	ug/L	ND	20	20.7	104	49-143	
Vinyl chloride	ug/L	ND	20	24.3	122	75-133	
Xylene (Total)	ug/L	ND	60	53.6	89	63-142	
1,2-Dichloroethane-d4 (S)	%				100	75-137	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				101	75-125	

SAMPLE DUPLICATE: 2629245

Parameter	Units	1290523014	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	ND	<0.064		30	
1,1,1-Trichloroethane	ug/L	ND	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	<0.055		30	
1,1,2-Trichloroethane	ug/L	ND	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	<0.13		30	
1,1-Dichloroethane	ug/L	ND	<0.055		30	
1,1-Dichloroethene	ug/L	ND	<0.069		30	
1,1-Dichloropropene	ug/L	ND	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	ND	<0.17		30	
1,2,3-Trichloropropane	ug/L	ND	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

SAMPLE DUPLICATE: 2629245

Parameter	Units	1290523014 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	ND	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	ND	<0.092		30	
1,2-Dichlorobenzene	ug/L	ND	<0.078		30	
1,2-Dichloroethane	ug/L	ND	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	ND	<0.16		30	
1,2-Dichloropropane	ug/L	ND	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	ND	<0.042		30	
1,3-Dichlorobenzene	ug/L	ND	<0.085		30	
1,3-Dichloropropane	ug/L	ND	<0.059		30	
1,4-Dichlorobenzene	ug/L	ND	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	<4.8		30	
2,2,4-Trimethylpentane	ug/L	ND	<0.087		30	
2,2-Dichloropropane	ug/L	ND	<0.096		30	
2-Butanone (MEK)	ug/L	ND	<1.1		30	
2-Chlorotoluene	ug/L	ND	<0.084		30	
2-Hexanone	ug/L	ND	<0.19		30	
4-Chlorotoluene	ug/L	ND	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	<0.80		30	
Acetone	ug/L	ND	25.2		30	CH
Acrolein	ug/L	ND	<2.1		30	
Acrylonitrile	ug/L	ND	<0.49		30	
Benzene	ug/L	ND	<0.042		30	
Bromobenzene	ug/L	ND	<0.087		30	
Bromochloromethane	ug/L	ND	<0.082		30	
Bromodichloromethane	ug/L	ND	<0.068		30	
Bromoform	ug/L	ND	<0.11		30	
Bromomethane	ug/L	ND	<0.20		30	
Carbon disulfide	ug/L	ND	<0.20		30	
Carbon tetrachloride	ug/L	ND	<0.079		30	
Chlorobenzene	ug/L	ND	<0.066		30	
Chloroethane	ug/L	ND	<0.12		30	
Chloroform	ug/L	ND	<0.21		30	
Chloromethane	ug/L	ND	<0.080		30	
cis-1,2-Dichloroethene	ug/L	ND	<0.12		30	
cis-1,3-Dichloropropene	ug/L	ND	<0.069		30	
Dibromochloromethane	ug/L	ND	<0.048		30	
Dibromomethane	ug/L	ND	<0.14		30	
Dichlorodifluoromethane	ug/L	ND	<0.075		30	
Dichlorofluoromethane	ug/L	ND	<0.054		30	
Diisopropyl ether	ug/L	ND	<0.050		30	
Ethyl-tert-butyl ether	ug/L	ND	<0.062		30	
Ethylbenzene	ug/L	ND	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	ND	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	ND	<0.064		30	
m&p-Xylene	ug/L	ND	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

SAMPLE DUPLICATE: 2629245

Parameter	Units	1290523014 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	ND	<0.047		30	
Methylene Chloride	ug/L	ND	<0.097		30	
n-Butylbenzene	ug/L	ND	<0.16		30	
n-Propylbenzene	ug/L	ND	<0.049		30	
Naphthalene	ug/L	ND	<0.064		30	
o-Xylene	ug/L	ND	<0.044		30	
p-Isopropyltoluene	ug/L	ND	<0.064		30	
sec-Butylbenzene	ug/L	ND	<0.094		30	
Styrene	ug/L	ND	<0.056		30	
tert-Amylmethyl ether	ug/L	ND	<0.073		30	
tert-Butyl Alcohol	ug/L	ND	<0.89		30	
tert-Butylbenzene	ug/L	ND	<0.051		30	
Tetrachloroethene	ug/L	ND	<0.13		30	
Tetrahydrofuran	ug/L	ND	<1.5		30	
Toluene	ug/L	ND	<0.059		30	
trans-1,2-Dichloroethene	ug/L	ND	<0.15		30	
trans-1,3-Dichloropropene	ug/L	ND	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	<0.45		30	
Trichloroethene	ug/L	ND	<0.044		30	
Trichlorofluoromethane	ug/L	ND	<0.055		30	
Vinyl acetate	ug/L	ND	<0.12		30	
Vinyl chloride	ug/L	ND	<0.098		30	
Xylene (Total)	ug/L	ND	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	108	106	2		
4-Bromofluorobenzene (S)	%	99	100	1		
Toluene-d8 (S)	%	98	99	0		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 482682

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393713

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393713

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10393713001	Marlow #2-GW-062617	EPA 8260B	482682		

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### REPORT OF LABORATORY ANALYSIS

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**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: UPRR CH2M H2I Project #: \_\_\_\_\_

**WO#: 10393713**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
 Tracking Number: 7096 33718841

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No  
 Thermometer  151401163      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Used:  151401164

Cooler Temp Read (°C): 0.7      Cooler Temp Corrected (°C): 0.8      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: +0.1      Date and Initials of Person Examining Contents: ME 6-27-17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Colliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	
Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>No trip blank</u>
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1012</u>	Temp: <u>0.7</u>	Corrected Temp: <u>0.8</u>
Time: _____	put in cooler	
Time: <u>1023</u>	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: 06/27/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

July 06, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

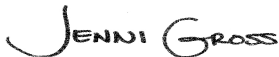
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393714

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10393714001	Thorson-GW-062617	Water	06/26/17 12:40	06/27/17 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393714001	Thorson-GW-062617	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393714001</b>	<b>Thorson-GW-062617</b>					
EPA 8260B	Acetone	14.0J	ug/L	20.0	06/30/17 17:55	CH,L1

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 06, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 482682

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- DUP (Lab ID: 2629245)
  - Acetone
- LCS (Lab ID: 2629242)
  - Acetone
- LCSD (Lab ID: 2629243)
  - Acetone
- MS (Lab ID: 2629244)
  - Acetone
- Thorson-GW-062617 (Lab ID: 10393714001)
  - Acetone

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 482682

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2629242)
  - Acetone
- LCSD (Lab ID: 2629243)
  - Acetone

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 06, 2017

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482682

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

Sample: **Thorson-GW-062617** Lab ID: **10393714001** Collected: 06/26/17 12:40 Received: 06/27/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/30/17 17:55	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/30/17 17:55	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/30/17 17:55	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/30/17 17:55	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/30/17 17:55	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/30/17 17:55	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/30/17 17:55	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/30/17 17:55	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/30/17 17:55	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/30/17 17:55	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/30/17 17:55	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/30/17 17:55	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/30/17 17:55	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/30/17 17:55	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/30/17 17:55	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/30/17 17:55	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/30/17 17:55	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/30/17 17:55	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/30/17 17:55	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/30/17 17:55	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/30/17 17:55	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/30/17 17:55	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/30/17 17:55	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/30/17 17:55	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/30/17 17:55	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/30/17 17:55	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/30/17 17:55	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		06/30/17 17:55	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/30/17 17:55	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		06/30/17 17:55	108-10-1	
Acetone	14.0J	ug/L	20.0	0.64	1		06/30/17 17:55	67-64-1	CH,L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/30/17 17:55	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/30/17 17:55	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/30/17 17:55	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/30/17 17:55	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/30/17 17:55	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/30/17 17:55	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/30/17 17:55	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/30/17 17:55	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/30/17 17:55	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		06/30/17 17:55	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/30/17 17:55	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/30/17 17:55	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		06/30/17 17:55	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/30/17 17:55	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/30/17 17:55	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

**Sample: Thorson-GW-062617**      **Lab ID: 10393714001**      Collected: 06/26/17 12:40      Received: 06/27/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/30/17 17:55	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/30/17 17:55	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/30/17 17:55	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/30/17 17:55	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/30/17 17:55	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/30/17 17:55	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/30/17 17:55	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/30/17 17:55	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/30/17 17:55	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/30/17 17:55	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/30/17 17:55	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/30/17 17:55	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/30/17 17:55	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/30/17 17:55	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/30/17 17:55	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/30/17 17:55	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/30/17 17:55	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/30/17 17:55	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/30/17 17:55	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/30/17 17:55	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/30/17 17:55	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/30/17 17:55	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/30/17 17:55	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/30/17 17:55	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/30/17 17:55	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/30/17 17:55	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/30/17 17:55	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/30/17 17:55	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/30/17 17:55	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/30/17 17:55	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/30/17 17:55	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/30/17 17:55	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/30/17 17:55	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/30/17 17:55	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	110	%	75-137		1		06/30/17 17:55	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		06/30/17 17:55	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		06/30/17 17:55	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393714

QC Batch: 482682 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10393714001

METHOD BLANK: 2629241 Matrix: Water  
Associated Lab Samples: 10393714001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/30/17 10:41	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/30/17 10:41	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/30/17 10:41	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/30/17 10:41	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/30/17 10:41	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/30/17 10:41	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/30/17 10:41	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/30/17 10:41	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/30/17 10:41	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/30/17 10:41	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/30/17 10:41	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/30/17 10:41	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/30/17 10:41	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/30/17 10:41	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/30/17 10:41	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/30/17 10:41	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/30/17 10:41	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/30/17 10:41	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/30/17 10:41	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/30/17 10:41	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/30/17 10:41	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/30/17 10:41	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/30/17 10:41	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/30/17 10:41	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/30/17 10:41	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/30/17 10:41	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/30/17 10:41	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/30/17 10:41	
Acetone	ug/L	<0.64	20.0	0.64	06/30/17 10:41	
Acrolein	ug/L	<2.1	10.0	2.1	06/30/17 10:41	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/30/17 10:41	
Benzene	ug/L	<0.042	0.50	0.042	06/30/17 10:41	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/30/17 10:41	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/30/17 10:41	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/30/17 10:41	
Bromoform	ug/L	<0.11	4.0	0.11	06/30/17 10:41	
Bromomethane	ug/L	<0.20	4.0	0.20	06/30/17 10:41	
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/30/17 10:41	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/30/17 10:41	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393714

METHOD BLANK: 2629241 Matrix: Water  
Associated Lab Samples: 10393714001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/30/17 10:41	
Chloroethane	ug/L	<0.12	1.0	0.12	06/30/17 10:41	
Chloroform	ug/L	<0.21	1.0	0.21	06/30/17 10:41	
Chloromethane	ug/L	<0.080	4.0	0.080	06/30/17 10:41	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/30/17 10:41	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/30/17 10:41	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/30/17 10:41	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/30/17 10:41	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/30/17 10:41	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/30/17 10:41	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/30/17 10:41	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/30/17 10:41	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/30/17 10:41	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/30/17 10:41	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/30/17 10:41	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/30/17 10:41	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/30/17 10:41	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/30/17 10:41	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/30/17 10:41	
Naphthalene	ug/L	<0.064	1.0	0.064	06/30/17 10:41	
o-Xylene	ug/L	<0.044	0.50	0.044	06/30/17 10:41	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/30/17 10:41	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/30/17 10:41	
Styrene	ug/L	<0.056	0.50	0.056	06/30/17 10:41	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/30/17 10:41	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/30/17 10:41	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/30/17 10:41	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/30/17 10:41	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/30/17 10:41	
Toluene	ug/L	<0.059	0.50	0.059	06/30/17 10:41	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/30/17 10:41	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/30/17 10:41	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/30/17 10:41	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/30/17 10:41	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/30/17 10:41	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/30/17 10:41	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/30/17 10:41	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/30/17 10:41	
1,2-Dichloroethane-d4 (S)	%	106	75-137		06/30/17 10:41	
4-Bromofluorobenzene (S)	%	101	75-125		06/30/17 10:41	
Toluene-d8 (S)	%	101	75-125		06/30/17 10:41	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393714

LABORATORY CONTROL SAMPLE & LCSD: 2629242		2629243									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	22.0	20.0	110	100	75-136	10	30		
1,1,1-Trichloroethane	ug/L	20	21.2	19.7	106	99	75-129	8	30		
1,1,2,2-Tetrachloroethane	ug/L	20	22.0	20.8	110	104	71-138	6	30		
1,1,2-Trichloroethane	ug/L	20	23.4	21.5	117	108	75-125	8	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	22.0	21.3	110	106	69-126	3	30		
1,1-Dichloroethane	ug/L	20	21.8	20.4	109	102	75-125	6	30		
1,1-Dichloroethene	ug/L	20	22.1	20.8	111	104	75-125	6	30		
1,1-Dichloropropene	ug/L	20	21.5	19.9	108	100	75-125	8	30		
1,2,3-Trichlorobenzene	ug/L	20	19.3	19.8	97	99	75-125	2	30		
1,2,3-Trichloropropane	ug/L	20	21.2	20.4	106	102	75-125	4	30		
1,2,4-Trichlorobenzene	ug/L	20	20.1	19.4	101	97	75-125	4	30		
1,2,4-Trimethylbenzene	ug/L	20	20.4	19.6	102	98	75-125	4	30		
1,2-Dibromo-3-chloropropane	ug/L	50	46.3	42.8	93	86	71-130	8	30		
1,2-Dibromoethane (EDB)	ug/L	20	23.0	21.2	115	106	75-125	8	30		
1,2-Dichlorobenzene	ug/L	20	20.5	19.4	103	97	75-125	6	30		
1,2-Dichloroethane	ug/L	20	22.4	20.3	112	102	70-125	10	30		
1,2-Dichloroethene (Total)	ug/L	40	42.3	39.5	106	99	75-125	7	30		
1,2-Dichloropropane	ug/L	20	21.6	20.7	108	103	75-125	4	30		
1,3,5-Trimethylbenzene	ug/L	20	19.9	19.0	100	95	75-125	5	30		
1,3-Dichlorobenzene	ug/L	20	21.6	20.2	108	101	75-125	7	30		
1,3-Dichloropropane	ug/L	20	22.0	20.4	110	102	75-125	7	30		
1,4-Dichlorobenzene	ug/L	20	20.1	19.0	101	95	75-125	6	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	395	409	99	102	64-140	4	30		
2,2,4-Trimethylpentane	ug/L	20	20.3	20.0	101	100	68-125	1	30		
2,2-Dichloropropane	ug/L	20	22.2	20.6	111	103	70-131	8	30		
2-Butanone (MEK)	ug/L	100	106	99.7	106	100	69-125	6	30		
2-Chlorotoluene	ug/L	20	20.0	19.0	100	95	75-125	5	30		
2-Hexanone	ug/L	100	109	102	109	102	73-129	7	30		
4-Chlorotoluene	ug/L	20	21.3	20.0	107	100	75-125	6	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	97.6	105	98	73-125	7	30		
Acetone	ug/L	100	169	152	169	152	66-126	10	30	CH,L1	
Acrolein	ug/L	200	244	229	122	115	56-150	6	30		
Acrylonitrile	ug/L	200	212	196	106	98	68-129	8	30		
Benzene	ug/L	20	20.6	19.4	103	97	75-125	6	30		
Bromobenzene	ug/L	20	21.1	19.8	106	99	75-125	7	30		
Bromochloromethane	ug/L	20	22.6	20.7	113	103	75-126	9	30		
Bromodichloromethane	ug/L	20	23.0	21.3	115	107	75-133	8	30		
Bromoform	ug/L	20	18.1	17.5	91	88	62-142	3	30		
Bromomethane	ug/L	20	12.4	13.7	62	69	34-143	10	30		
Carbon disulfide	ug/L	20	21.5	20.5	107	102	71-125	5	30		
Carbon tetrachloride	ug/L	20	21.2	20.3	106	101	71-145	5	30		
Chlorobenzene	ug/L	20	20.6	19.0	103	95	75-125	8	30		
Chloroethane	ug/L	20	23.3	22.4	117	112	75-125	4	30		
Chloroform	ug/L	20	21.0	19.4	105	97	75-125	8	30		
Chloromethane	ug/L	20	18.2	17.3	91	87	54-125	5	30		
cis-1,2-Dichloroethene	ug/L	20	21.4	19.7	107	98	75-125	8	30		
cis-1,3-Dichloropropene	ug/L	20	21.6	20.4	108	102	75-125	6	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393714

LABORATORY CONTROL SAMPLE & LCSD: 2629242		2629243								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	21.9	20.2	110	101	74-141	8	30	
Dibromomethane	ug/L	20	22.2	20.4	111	102	75-125	8	30	
Dichlorodifluoromethane	ug/L	20	24.5	23.1	122	115	59-130	6	30	
Dichlorofluoromethane	ug/L	20	22.0	21.1	110	106	75-125	4	30	
Diisopropyl ether	ug/L	20	21.3	19.7	106	98	69-125	8	30	
Ethyl-tert-butyl ether	ug/L	20	21.1	19.5	105	97	73-125	8	30	
Ethylbenzene	ug/L	20	19.9	18.9	100	94	75-125	5	30	
Hexachloro-1,3-butadiene	ug/L	20	21.9	20.6	110	103	75-131	6	30	
Isopropylbenzene (Cumene)	ug/L	20	19.9	18.8	100	94	75-125	6	30	
m&p-Xylene	ug/L	40	40.2	38.2	101	95	75-125	5	30	
Methyl-tert-butyl ether	ug/L	20	21.4	20.2	107	101	75-125	6	30	
Methylene Chloride	ug/L	20	21.1	19.6	105	98	73-125	7	30	
n-Butylbenzene	ug/L	20	22.3	21.2	112	106	75-125	5	30	
n-Propylbenzene	ug/L	20	19.7	19.2	98	96	75-125	2	30	
Naphthalene	ug/L	20	17.5	17.8	88	89	74-125	1	30	
o-Xylene	ug/L	20	20.1	19.0	101	95	75-125	6	30	
p-Isopropyltoluene	ug/L	20	21.0	20.0	105	100	75-125	5	30	
sec-Butylbenzene	ug/L	20	19.9	19.6	99	98	75-125	1	30	
Styrene	ug/L	20	20.9	19.4	105	97	75-125	7	30	
tert-Amylmethyl ether	ug/L	20	20.7	19.2	103	96	71-126	8	30	
tert-Butyl Alcohol	ug/L	200	200	210	100	105	69-131	5	30	
tert-Butylbenzene	ug/L	20	19.4	18.5	97	92	75-125	5	30	
Tetrachloroethene	ug/L	20	20.4	19.8	102	99	75-125	3	30	
Tetrahydrofuran	ug/L	200	234	208	117	104	65-127	12	30	
Toluene	ug/L	20	20.8	19.2	104	96	75-125	8	30	
trans-1,2-Dichloroethene	ug/L	20	20.9	19.8	105	99	75-125	6	30	
trans-1,3-Dichloropropene	ug/L	20	21.3	19.8	107	99	75-125	8	30	
trans-1,4-Dichloro-2-butene	ug/L	50	44.2	41.5	88	83	30-150	6	30	
Trichloroethene	ug/L	20	21.2	20.0	106	100	75-125	6	30	
Trichlorofluoromethane	ug/L	20	23.2	22.2	116	111	71-140	4	30	
Vinyl acetate	ug/L	20	25.1	23.2	126	116	68-137	8	30	
Vinyl chloride	ug/L	20	23.1	21.9	116	110	70-125	5	30	
Xylene (Total)	ug/L	60	60.4	57.1	101	95	75-125	5	30	
1,2-Dichloroethane-d4 (S)	%				104	102	75-137			
4-Bromofluorobenzene (S)	%				100	98	75-125			
Toluene-d8 (S)	%				101	101	75-125			

MATRIX SPIKE SAMPLE: 2629244		1290523013	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.1	96	75-137	
1,1,1-Trichloroethane	ug/L	ND	20	19.8	99	75-139	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.8	94	60-142	
1,1,2-Trichloroethane	ug/L	ND	20	19.6	98	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	23.3	117	62-150	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

MATRIX SPIKE SAMPLE: 2629244		1290523013	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	ND	20	19.7	98	70-129	
1,1-Dichloroethene	ug/L	ND	20	22.4	112	67-141	
1,1-Dichloropropene	ug/L	ND	20	20.1	101	64-144	
1,2,3-Trichlorobenzene	ug/L	ND	20	19.2	96	66-139	
1,2,3-Trichloropropane	ug/L	ND	20	17.9	89	69-134	
1,2,4-Trichlorobenzene	ug/L	ND	20	19.6	98	65-138	
1,2,4-Trimethylbenzene	ug/L	ND	20	18.9	94	65-143	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	38.8	78	61-134	
1,2-Dibromoethane (EDB)	ug/L	ND	20	19.5	97	74-129	
1,2-Dichlorobenzene	ug/L	ND	20	18.0	90	68-135	
1,2-Dichloroethane	ug/L	ND	20	18.7	94	73-125	
1,2-Dichloroethene (Total)	ug/L	ND	40	38.5	96	69-134	
1,2-Dichloropropane	ug/L	ND	20	19.3	97	64-130	
1,3,5-Trimethylbenzene	ug/L	ND	20	18.8	94	64-146	
1,3-Dichlorobenzene	ug/L	ND	20	18.9	94	69-135	
1,3-Dichloropropane	ug/L	ND	20	18.5	92	67-128	
1,4-Dichlorobenzene	ug/L	ND	20	18.2	91	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	348	87	58-140	
2,2,4-Trimethylpentane	ug/L	ND	20	26.1	130	48-150	
2,2-Dichloropropane	ug/L	ND	20	20.7	103	50-150	
2-Butanone (MEK)	ug/L	ND	100	80.6	81	58-125	
2-Chlorotoluene	ug/L	ND	20	18.2	91	65-138	
2-Hexanone	ug/L	ND	100	87.5	88	61-134	
4-Chlorotoluene	ug/L	ND	20	18.6	93	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	89.5	89	61-130	
Acetone	ug/L	ND	100	178	178	51-140	CH,M0
Acrolein	ug/L	ND	200	266	133	48-150	
Acrylonitrile	ug/L	ND	200	178	89	55-134	
Benzene	ug/L	ND	20	18.7	94	63-132	
Bromobenzene	ug/L	ND	20	18.6	93	67-138	
Bromochloromethane	ug/L	ND	20	19.5	97	66-138	
Bromodichloromethane	ug/L	ND	20	19.7	99	75-137	
Bromoform	ug/L	ND	20	15.6	78	65-129	
Bromomethane	ug/L	ND	20	14.8	74	41-150	
Carbon disulfide	ug/L	ND	20	21.3	107	72-132	
Carbon tetrachloride	ug/L	ND	20	20.6	103	75-150	
Chlorobenzene	ug/L	ND	20	18.1	91	73-127	
Chloroethane	ug/L	ND	20	23.6	118	74-138	
Chloroform	ug/L	ND	20	18.5	93	74-125	
Chloromethane	ug/L	ND	20	16.4	82	58-129	
cis-1,2-Dichloroethene	ug/L	ND	20	18.7	93	63-135	
cis-1,3-Dichloropropene	ug/L	ND	20	18.4	92	66-129	
Dibromochloromethane	ug/L	ND	20	18.7	94	75-133	
Dibromomethane	ug/L	ND	20	18.1	90	68-134	
Dichlorodifluoromethane	ug/L	ND	20	27.8	139	72-150	
Dichlorofluoromethane	ug/L	ND	20	22.0	110	75-129	
Diisopropyl ether	ug/L	ND	20	18.0	90	62-128	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

MATRIX SPIKE SAMPLE: 2629244		1290523013	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	ND	20	18.0	90	63-132	
Ethylbenzene	ug/L	ND	20	17.7	89	72-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	26.3	132	71-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	18.0	90	70-136	
m&p-Xylene	ug/L	ND	40	35.7	89	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	18.3	92	72-125	
Methylene Chloride	ug/L	ND	20	18.1	91	60-132	
n-Butylbenzene	ug/L	ND	20	23.1	116	60-150	
n-Propylbenzene	ug/L	ND	20	18.7	93	63-142	
Naphthalene	ug/L	ND	20	16.3	81	67-125	
o-Xylene	ug/L	ND	20	17.9	89	60-143	
p-Isopropyltoluene	ug/L	ND	20	21.0	105	64-146	
sec-Butylbenzene	ug/L	ND	20	20.9	104	67-144	
Styrene	ug/L	ND	20	18.4	92	67-136	
tert-Amylmethyl ether	ug/L	ND	20	17.6	88	60-134	
tert-Butyl Alcohol	ug/L	ND	200	182	91	56-146	
tert-Butylbenzene	ug/L	ND	20	18.7	94	68-135	
Tetrachloroethene	ug/L	ND	20	19.0	95	67-148	
Tetrahydrofuran	ug/L	ND	200	259	129	51-141	
Toluene	ug/L	ND	20	18.9	95	61-140	
trans-1,2-Dichloroethene	ug/L	ND	20	19.8	99	62-138	
trans-1,3-Dichloropropene	ug/L	ND	20	18.1	90	67-134	
trans-1,4-Dichloro-2-butene	ug/L	ND	50	37.8	76	30-150	
Trichloroethene	ug/L	ND	20	19.6	98	64-149	
Trichlorofluoromethane	ug/L	ND	20	25.5	127	75-150	
Vinyl acetate	ug/L	ND	20	20.7	104	49-143	
Vinyl chloride	ug/L	ND	20	24.3	122	75-133	
Xylene (Total)	ug/L	ND	60	53.6	89	63-142	
1,2-Dichloroethane-d4 (S)	%				100	75-137	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				101	75-125	

SAMPLE DUPLICATE: 2629245

Parameter	Units	1290523014	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	ND	<0.064		30	
1,1,1-Trichloroethane	ug/L	ND	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	<0.055		30	
1,1,2-Trichloroethane	ug/L	ND	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	<0.13		30	
1,1-Dichloroethane	ug/L	ND	<0.055		30	
1,1-Dichloroethene	ug/L	ND	<0.069		30	
1,1-Dichloropropene	ug/L	ND	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	ND	<0.17		30	
1,2,3-Trichloropropane	ug/L	ND	<0.19		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

SAMPLE DUPLICATE: 2629245

Parameter	Units	1290523014 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	ND	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	ND	<0.092		30	
1,2-Dichlorobenzene	ug/L	ND	<0.078		30	
1,2-Dichloroethane	ug/L	ND	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	ND	<0.16		30	
1,2-Dichloropropane	ug/L	ND	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	ND	<0.042		30	
1,3-Dichlorobenzene	ug/L	ND	<0.085		30	
1,3-Dichloropropane	ug/L	ND	<0.059		30	
1,4-Dichlorobenzene	ug/L	ND	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	<4.8		30	
2,2,4-Trimethylpentane	ug/L	ND	<0.087		30	
2,2-Dichloropropane	ug/L	ND	<0.096		30	
2-Butanone (MEK)	ug/L	ND	<1.1		30	
2-Chlorotoluene	ug/L	ND	<0.084		30	
2-Hexanone	ug/L	ND	<0.19		30	
4-Chlorotoluene	ug/L	ND	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	<0.80		30	
Acetone	ug/L	ND	25.2		30	CH
Acrolein	ug/L	ND	<2.1		30	
Acrylonitrile	ug/L	ND	<0.49		30	
Benzene	ug/L	ND	<0.042		30	
Bromobenzene	ug/L	ND	<0.087		30	
Bromochloromethane	ug/L	ND	<0.082		30	
Bromodichloromethane	ug/L	ND	<0.068		30	
Bromoform	ug/L	ND	<0.11		30	
Bromomethane	ug/L	ND	<0.20		30	
Carbon disulfide	ug/L	ND	<0.20		30	
Carbon tetrachloride	ug/L	ND	<0.079		30	
Chlorobenzene	ug/L	ND	<0.066		30	
Chloroethane	ug/L	ND	<0.12		30	
Chloroform	ug/L	ND	<0.21		30	
Chloromethane	ug/L	ND	<0.080		30	
cis-1,2-Dichloroethene	ug/L	ND	<0.12		30	
cis-1,3-Dichloropropene	ug/L	ND	<0.069		30	
Dibromochloromethane	ug/L	ND	<0.048		30	
Dibromomethane	ug/L	ND	<0.14		30	
Dichlorodifluoromethane	ug/L	ND	<0.075		30	
Dichlorofluoromethane	ug/L	ND	<0.054		30	
Diisopropyl ether	ug/L	ND	<0.050		30	
Ethyl-tert-butyl ether	ug/L	ND	<0.062		30	
Ethylbenzene	ug/L	ND	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	ND	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	ND	<0.064		30	
m&p-Xylene	ug/L	ND	<0.11		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

SAMPLE DUPLICATE: 2629245

Parameter	Units	1290523014 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	ND	<0.047		30	
Methylene Chloride	ug/L	ND	<0.097		30	
n-Butylbenzene	ug/L	ND	<0.16		30	
n-Propylbenzene	ug/L	ND	<0.049		30	
Naphthalene	ug/L	ND	<0.064		30	
o-Xylene	ug/L	ND	<0.044		30	
p-Isopropyltoluene	ug/L	ND	<0.064		30	
sec-Butylbenzene	ug/L	ND	<0.094		30	
Styrene	ug/L	ND	<0.056		30	
tert-Amylmethyl ether	ug/L	ND	<0.073		30	
tert-Butyl Alcohol	ug/L	ND	<0.89		30	
tert-Butylbenzene	ug/L	ND	<0.051		30	
Tetrachloroethene	ug/L	ND	<0.13		30	
Tetrahydrofuran	ug/L	ND	<1.5		30	
Toluene	ug/L	ND	<0.059		30	
trans-1,2-Dichloroethene	ug/L	ND	<0.15		30	
trans-1,3-Dichloropropene	ug/L	ND	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	<0.45		30	
Trichloroethene	ug/L	ND	<0.044		30	
Trichlorofluoromethane	ug/L	ND	<0.055		30	
Vinyl acetate	ug/L	ND	<0.12		30	
Vinyl chloride	ug/L	ND	<0.098		30	
Xylene (Total)	ug/L	ND	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	108	106	2		
4-Bromofluorobenzene (S)	%	99	100	1		
Toluene-d8 (S)	%	98	99	0		

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 482682

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393714

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393714

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10393714001	Thorson-GW-062617	EPA 8260B	482682		

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### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10393714

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:	Page: 1 Of 1
Company: CH2M Hill Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201 Email: Phone: Requested Due Date: <b>10 Day Standard</b>	Report To: Mark Ochsner, Brad Ostapkowicz Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com Purchase Order # PEDD# 1497 Project Name: UPRR Freeman Project #: 1497	Attention: Anne Theriault Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221 Pace Quote: Contract# 758938 Pace Project Manager: Jennifer Gross Pace Profile #: 36447 / 4	Regulatory Agency State / Location WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soli/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test	Y/N	Y	Requested Analysis Filtered (Y/N)																			
						DATE	TIME			DATE	TIME	Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate				Other	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 6310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	BOD 10360WLL	Nitrate-Nitrite 353.2	CSIA of CTET (6260 Analysis Required)							
1	THORSON - GW - 062617	WTG					6/26/17	12:40	3					3				X																					CO1
2	<del>TRIP BLANK 2</del>								1									X																					
3																																							
4																																							
5																																							
6																																							
7																																							
8																																							
9																																							
10																																							
11																																							
12																																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	REUBEN GRUBER / CH2M	6/26/17	17:00	FRED EX	6/26/17	17:00				
*Field filtered by client				JAMES PACE	6/27/17	9:30	0.2	Y	Y	Y

Page 21 of 22  
THIS CHAIN ON INDIVIDUAL REPORT

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	
SIGNATURE of SAMPLER:	DATE Signed: 6/26/17

Sample Condition Upon Receipt - ESI Tech Specs  
 Client Name: DPRR CH2M H2I Project #: **WO# : 10393714**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 709633718841  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_  
 Thermometer Used:  151401163  151401164  
 Type of Ice:  Wet  Blue  None  
 Temp Blank?  Yes  No  
 Samples on ice, cooling process has begun

Cooler Temp Read (°C): 0.7 Cooler Temp Corrected (°C): 0.8 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: ME 6-27-17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>No trip blank</u>
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1012</u>	Temp: <u>0.7</u>	Corrected Temp: <u>0.8</u>
Time: _____	put in cooler	
Time: <u>1023</u>	Temp: _____	Corrected Temp: _____

Project Manager Review: JENNI GROSS Date: 06/27/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 12, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

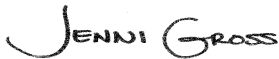
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393715

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10393715001	MW9D-GW-062617	Water	06/26/17 11:40	06/27/17 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393715

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393715001	MW9D-GW-062617	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393715001</b>	<b>MW9D-GW-062617</b>					
EPA 8260B	Acetone	18.5J	ug/L	20.0	07/10/17 18:22	
EPA 8260B	Carbon disulfide	0.28J	ug/L	1.0	07/10/17 18:22	
EPA 8260B	Carbon tetrachloride	104	ug/L	0.50	07/10/17 18:22	
EPA 8260B	Chloroform	4.2	ug/L	1.0	07/10/17 18:22	

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

**General Information:**

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484092

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

Sample: **MW9D-GW-062617** Lab ID: **10393715001** Collected: 06/26/17 11:40 Received: 06/27/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/10/17 18:22	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/10/17 18:22	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/10/17 18:22	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/10/17 18:22	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/10/17 18:22	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/10/17 18:22	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/10/17 18:22	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/10/17 18:22	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/10/17 18:22	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/10/17 18:22	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/10/17 18:22	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/10/17 18:22	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/10/17 18:22	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/10/17 18:22	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/10/17 18:22	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/10/17 18:22	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/10/17 18:22	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/10/17 18:22	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/10/17 18:22	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/10/17 18:22	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/10/17 18:22	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/10/17 18:22	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/10/17 18:22	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/10/17 18:22	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/10/17 18:22	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/10/17 18:22	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/10/17 18:22	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/10/17 18:22	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/10/17 18:22	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/10/17 18:22	108-10-1	
Acetone	18.5J	ug/L	20.0	0.64	1		07/10/17 18:22	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/10/17 18:22	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/10/17 18:22	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/10/17 18:22	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/10/17 18:22	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/10/17 18:22	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/10/17 18:22	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/10/17 18:22	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/10/17 18:22	74-83-9	
Carbon disulfide	0.28J	ug/L	1.0	0.20	1		07/10/17 18:22	75-15-0	
Carbon tetrachloride	104	ug/L	0.50	0.079	1		07/10/17 18:22	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/10/17 18:22	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/10/17 18:22	75-00-3	
Chloroform	4.2	ug/L	1.0	0.21	1		07/10/17 18:22	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/10/17 18:22	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/10/17 18:22	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

Sample: **MW9D-GW-062617** Lab ID: **10393715001** Collected: 06/26/17 11:40 Received: 06/27/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/10/17 18:22	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/10/17 18:22	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/10/17 18:22	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/10/17 18:22	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/10/17 18:22	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/10/17 18:22	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/10/17 18:22	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/10/17 18:22	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/10/17 18:22	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		07/10/17 18:22	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/10/17 18:22	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/10/17 18:22	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/10/17 18:22	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/10/17 18:22	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/10/17 18:22	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/10/17 18:22	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/10/17 18:22	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/10/17 18:22	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/10/17 18:22	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/10/17 18:22	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/10/17 18:22	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/10/17 18:22	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/10/17 18:22	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/10/17 18:22	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/10/17 18:22	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/10/17 18:22	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/10/17 18:22	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/10/17 18:22	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/10/17 18:22	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/10/17 18:22	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/10/17 18:22	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/10/17 18:22	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/10/17 18:22	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/10/17 18:22	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		07/10/17 18:22	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		07/10/17 18:22	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		07/10/17 18:22	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393715

QC Batch: 484092      Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B      Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10393715001

METHOD BLANK: 2636222      Matrix: Water  
Associated Lab Samples: 10393715001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	07/10/17 11:49	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	07/10/17 11:49	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	07/10/17 11:49	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	07/10/17 11:49	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	07/10/17 11:49	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	07/10/17 11:49	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	07/10/17 11:49	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	07/10/17 11:49	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	07/10/17 11:49	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	07/10/17 11:49	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	07/10/17 11:49	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	1.0	0.068	07/10/17 11:49	MN
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	07/10/17 11:49	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	07/10/17 11:49	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	07/10/17 11:49	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	07/10/17 11:49	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	07/10/17 11:49	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	07/10/17 11:49	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	07/10/17 11:49	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	07/10/17 11:49	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	07/10/17 11:49	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	07/10/17 11:49	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	07/10/17 11:49	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	07/10/17 11:49	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	07/10/17 11:49	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	07/10/17 11:49	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	07/10/17 11:49	
2-Hexanone	ug/L	<0.19	5.0	0.19	07/10/17 11:49	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	07/10/17 11:49	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	07/10/17 11:49	
Acetone	ug/L	<0.64	20.0	0.64	07/10/17 11:49	
Acrolein	ug/L	<2.1	10.0	2.1	07/10/17 11:49	
Acrylonitrile	ug/L	<0.49	10.0	0.49	07/10/17 11:49	
Benzene	ug/L	<0.042	0.50	0.042	07/10/17 11:49	
Bromobenzene	ug/L	<0.087	0.50	0.087	07/10/17 11:49	
Bromochloromethane	ug/L	<0.082	1.0	0.082	07/10/17 11:49	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	07/10/17 11:49	
Bromoform	ug/L	<0.11	4.0	0.11	07/10/17 11:49	
Bromomethane	ug/L	<0.20	4.0	0.20	07/10/17 11:49	
Carbon disulfide	ug/L	<0.20	1.0	0.20	07/10/17 11:49	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	07/10/17 11:49	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393715

METHOD BLANK: 2636222 Matrix: Water  
Associated Lab Samples: 10393715001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	07/10/17 11:49	
Chloroethane	ug/L	<0.12	1.0	0.12	07/10/17 11:49	
Chloroform	ug/L	<0.21	1.0	0.21	07/10/17 11:49	
Chloromethane	ug/L	<0.080	4.0	0.080	07/10/17 11:49	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	07/10/17 11:49	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	07/10/17 11:49	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	07/10/17 11:49	
Dibromomethane	ug/L	<0.14	1.0	0.14	07/10/17 11:49	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	07/10/17 11:49	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	07/10/17 11:49	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	07/10/17 11:49	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	07/10/17 11:49	
Ethylbenzene	ug/L	<0.075	0.50	0.075	07/10/17 11:49	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	07/10/17 11:49	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	07/10/17 11:49	
m&p-Xylene	ug/L	<0.11	1.0	0.11	07/10/17 11:49	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	07/10/17 11:49	
Methylene Chloride	ug/L	<0.097	4.0	0.097	07/10/17 11:49	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	07/10/17 11:49	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	07/10/17 11:49	
Naphthalene	ug/L	<0.064	4.0	0.064	07/10/17 11:49	MN
o-Xylene	ug/L	<0.044	0.50	0.044	07/10/17 11:49	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	07/10/17 11:49	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	07/10/17 11:49	
Styrene	ug/L	<0.056	0.50	0.056	07/10/17 11:49	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	07/10/17 11:49	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	07/10/17 11:49	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	07/10/17 11:49	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	07/10/17 11:49	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	07/10/17 11:49	
Toluene	ug/L	<0.059	0.50	0.059	07/10/17 11:49	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	07/10/17 11:49	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	07/10/17 11:49	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	07/10/17 11:49	
Trichloroethene	ug/L	<0.044	0.40	0.044	07/10/17 11:49	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	07/10/17 11:49	
Vinyl acetate	ug/L	<0.12	10.0	0.12	07/10/17 11:49	
Vinyl chloride	ug/L	<0.098	0.20	0.098	07/10/17 11:49	
Xylene (Total)	ug/L	<0.15	1.5	0.15	07/10/17 11:49	
1,2-Dichloroethane-d4 (S)	%	105	75-137		07/10/17 11:49	
4-Bromofluorobenzene (S)	%	99	75-125		07/10/17 11:49	
Toluene-d8 (S)	%	96	75-125		07/10/17 11:49	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

LABORATORY CONTROL SAMPLE & LCSD: 2636223		2636224									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.3	19.7	101	99	75-136	3	30		
1,1,1-Trichloroethane	ug/L	20	19.9	19.0	99	95	75-129	5	30		
1,1,2,2-Tetrachloroethane	ug/L	20	19.1	19.3	95	96	71-138	1	30		
1,1,2-Trichloroethane	ug/L	20	20.0	19.7	100	99	75-125	1	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.4	19.1	102	95	69-126	7	30		
1,1-Dichloroethane	ug/L	20	19.9	18.8	100	94	75-125	6	30		
1,1-Dichloroethene	ug/L	20	20.0	18.9	100	94	75-125	6	30		
1,1-Dichloropropene	ug/L	20	19.7	18.7	98	94	75-125	5	30		
1,2,3-Trichlorobenzene	ug/L	20	18.6	18.7	93	93	75-125	1	30		
1,2,3-Trichloropropane	ug/L	20	18.2	19.2	91	96	75-125	5	30		
1,2,4-Trichlorobenzene	ug/L	20	18.3	17.6	92	88	75-125	4	30		
1,2,4-Trimethylbenzene	ug/L	20	18.2	17.7	91	88	75-125	3	30		
1,2-Dibromo-3-chloropropane	ug/L	50	46.6	47.2	93	94	71-130	1	30		
1,2-Dibromoethane (EDB)	ug/L	20	19.9	19.7	100	99	75-125	1	30		
1,2-Dichlorobenzene	ug/L	20	19.1	18.7	95	94	75-125	2	30		
1,2-Dichloroethane	ug/L	20	19.7	18.5	99	92	70-125	6	30		
1,2-Dichloroethene (Total)	ug/L	40	40.8	37.9	102	95	75-125	7	30		
1,2-Dichloropropane	ug/L	20	19.6	18.9	98	94	75-125	4	30		
1,3,5-Trimethylbenzene	ug/L	20	19.4	18.9	97	95	75-125	3	30		
1,3-Dichlorobenzene	ug/L	20	18.8	18.3	94	92	75-125	2	30		
1,3-Dichloropropane	ug/L	20	20.4	19.5	102	98	75-125	4	30		
1,4-Dichlorobenzene	ug/L	20	18.2	17.8	91	89	75-125	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	405	385	101	96	64-140	5	30		
2,2,4-Trimethylpentane	ug/L	20	21.5	20.9	108	105	68-125	3	30		
2,2-Dichloropropane	ug/L	20	19.7	18.8	98	94	70-131	5	30		
2-Butanone (MEK)	ug/L	100	96.2	94.1	96	94	69-125	2	30		
2-Chlorotoluene	ug/L	20	18.5	18.4	93	92	75-125	0	30		
2-Hexanone	ug/L	100	101	101	101	101	73-129	0	30		
4-Chlorotoluene	ug/L	20	19.7	19.0	98	95	75-125	3	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	102	101	102	101	73-125	1	30		
Acetone	ug/L	100	121	104	121	104	66-126	15	30		
Acrolein	ug/L	200	214	203	107	101	56-150	5	30		
Acrylonitrile	ug/L	200	198	192	99	96	68-129	3	30		
Benzene	ug/L	20	19.2	18.2	96	91	75-125	6	30		
Bromobenzene	ug/L	20	18.4	17.8	92	89	75-125	3	30		
Bromochloromethane	ug/L	20	20.5	19.4	102	97	75-126	5	30		
Bromodichloromethane	ug/L	20	20.5	20.0	103	100	75-133	3	30		
Bromoform	ug/L	20	19.6	19.7	98	98	62-142	0	30		
Bromomethane	ug/L	20	18.7	19.0	94	95	34-143	2	30		
Carbon disulfide	ug/L	20	19.6	18.5	98	93	71-125	6	30		
Carbon tetrachloride	ug/L	20	20.6	19.5	103	97	71-145	6	30		
Chlorobenzene	ug/L	20	18.7	18.3	94	91	75-125	2	30		
Chloroethane	ug/L	20	20.7	19.7	104	99	75-125	5	30		
Chloroform	ug/L	20	19.0	18.3	95	92	75-125	4	30		
Chloromethane	ug/L	20	22.1	21.2	111	106	54-125	4	30		
cis-1,2-Dichloroethene	ug/L	20	20.7	19.4	103	97	75-125	7	30		
cis-1,3-Dichloropropene	ug/L	20	20.5	20.0	103	100	75-125	3	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

LABORATORY CONTROL SAMPLE & LCSD: 2636223			2636224								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.7	20.6	104	103	74-141	0	30		
Dibromomethane	ug/L	20	19.6	19.1	98	96	75-125	2	30		
Dichlorodifluoromethane	ug/L	20	21.6	20.2	108	101	59-130	7	30		
Dichlorofluoromethane	ug/L	20	19.9	19.0	100	95	75-125	5	30		
Diisopropyl ether	ug/L	20	19.5	18.8	97	94	69-125	4	30		
Ethyl-tert-butyl ether	ug/L	20	20.7	19.8	103	99	73-125	4	30		
Ethylbenzene	ug/L	20	19.0	18.1	95	90	75-125	5	30		
Hexachloro-1,3-butadiene	ug/L	20	19.0	18.8	95	94	75-131	1	30		
Isopropylbenzene (Cumene)	ug/L	20	20.7	19.8	104	99	75-125	5	30		
m&p-Xylene	ug/L	40	41.2	39.9	103	100	75-125	3	30		
Methyl-tert-butyl ether	ug/L	20	19.9	19.2	99	96	75-125	3	30		
Methylene Chloride	ug/L	20	19.6	18.6	98	93	73-125	5	30		
n-Butylbenzene	ug/L	20	20.2	19.0	101	95	75-125	6	30		
n-Propylbenzene	ug/L	20	18.7	18.3	94	91	75-125	3	30		
Naphthalene	ug/L	20	17.6	18.1	88	91	74-125	3	30		
o-Xylene	ug/L	20	20.2	19.9	101	99	75-125	2	30		
p-Isopropyltoluene	ug/L	20	20.1	19.1	101	95	75-125	5	30		
sec-Butylbenzene	ug/L	20	19.8	19.1	99	96	75-125	3	30		
Styrene	ug/L	20	20.5	20.0	103	100	75-125	3	30		
tert-Amylmethyl ether	ug/L	20	19.9	19.2	100	96	71-126	4	30		
tert-Butyl Alcohol	ug/L	200	207	193	103	97	69-131	7	30		
tert-Butylbenzene	ug/L	20	18.8	18.5	94	93	75-125	1	30		
Tetrachloroethene	ug/L	20	19.7	19.0	98	95	75-125	4	30		
Tetrahydrofuran	ug/L	200	251	224	126	112	65-127	12	30		
Toluene	ug/L	20	19.3	18.5	97	92	75-125	4	30		
trans-1,2-Dichloroethene	ug/L	20	20.2	18.6	101	93	75-125	8	30		
trans-1,3-Dichloropropene	ug/L	20	20.5	19.9	103	99	75-125	3	30		
trans-1,4-Dichloro-2-butene	ug/L	50	44.4	44.8	89	90	30-150	1	30		
Trichloroethene	ug/L	20	20.6	19.3	103	96	75-125	6	30		
Trichlorofluoromethane	ug/L	20	20.6	19.3	103	97	71-140	6	30		
Vinyl acetate	ug/L	20	19.6	19.4	98	97	68-137	1	30		
Vinyl chloride	ug/L	20	20.0	19.0	100	95	70-125	5	30		
Xylene (Total)	ug/L	60	61.3	59.7	102	100	75-125	3	30		
1,2-Dichloroethane-d4 (S)	%				100	99	75-137				
4-Bromofluorobenzene (S)	%				97	98	75-125				
Toluene-d8 (S)	%				100	99	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393715

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 484092

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10393715

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10393715

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10393715001	MW9D-GW-062617	EPA 8260B	484092		

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### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt - ESI  
 Tech Specs

Client Name: UPRR CH2M H2I Project #: WO# : 10393715

**WO# : 10393715**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other:  
 Tracking Number: 7096 33718841  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other:  
 Thermometer Used:  151401163  151401164  
 Type of Ice:  Wet  Blue  None  
 Temp Blank?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Samples on ice, cooling process has begun

Cooler Temp Read (°C): 0.7 Cooler Temp Corrected (°C): 0.8 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: ME 6-27-17  
 USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	Yes	No	N/A	COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1.
Chain of Custody Filled Out?	<input type="checkbox"/>	<input type="checkbox"/>		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		6.
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		8.
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9.
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>				
All containers needing acid/base preservation have been checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	15. <u>No trip blank</u>
Trip Blank Custody Seals Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: Lindsey Baumann

Field Data Required?  Yes  No  
 Date/Time: 06/29/17 14:20 - via phone

Comments/Resolution: Sample ID should be MW9D-GW-062617.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1012</u>	Temp: <u>0.7</u>	Corrected Temp: <u>0.8</u>
Time: _____	put in cooler	
Time: <u>1023</u>	Temp: _____	Corrected Temp: _____

Project Manager Review:

JENNI GROSS

Date: 06/27/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 12, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393917

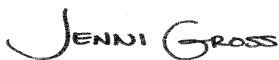
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on June 28, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on July 13, 2017 to change the sample ID from MW-15U to MW-15D, per client request

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

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<b>Lab ID</b>	<b>Sample ID</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Date Received</b>
10393917001	MW15D-GW-20-062617	Water	06/26/17 15:15	06/28/17 09:50

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393917

---

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10393917001	MW15D-GW-20-062617	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10393917001</b>	<b>MW15D-GW-20-062617</b>					
EPA 8260B	2-Hexanone	0.21J	ug/L	5.0	06/30/17 04:32	
EPA 8260B	4-Methyl-2-pentanone (MIBK)	2.3J	ug/L	5.0	06/30/17 04:32	
EPA 8260B	Acetone	9.2J	ug/L	20.0	06/30/17 04:32	L1
EPA 8260B	Carbon tetrachloride	2.1	ug/L	0.50	06/30/17 04:32	
EPA 8260B	Chloroform	0.26J	ug/L	1.0	06/30/17 04:32	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 482449

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2627820)
  - Bromomethane
- DUP (Lab ID: 2627824)
  - Bromomethane
- LCS (Lab ID: 2627821)
  - Bromomethane
- LCSD (Lab ID: 2627822)
  - Bromomethane
- MS (Lab ID: 2627823)
  - Bromomethane
- MW15D-GW-20-062617 (Lab ID: 10393917001)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 482449

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2627821)
  - Acetone

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 12, 2017

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 482449

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

Sample: MW15D-GW-20-062617 Lab ID: 10393917001 Collected: 06/26/17 15:15 Received: 06/28/17 09:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		06/30/17 04:32	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		06/30/17 04:32	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		06/30/17 04:32	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		06/30/17 04:32	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		06/30/17 04:32	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		06/30/17 04:32	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		06/30/17 04:32	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		06/30/17 04:32	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		06/30/17 04:32	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		06/30/17 04:32	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		06/30/17 04:32	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	0.50	0.068	1		06/30/17 04:32	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		06/30/17 04:32	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		06/30/17 04:32	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		06/30/17 04:32	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		06/30/17 04:32	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		06/30/17 04:32	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		06/30/17 04:32	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		06/30/17 04:32	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		06/30/17 04:32	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		06/30/17 04:32	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		06/30/17 04:32	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		06/30/17 04:32	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		06/30/17 04:32	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		06/30/17 04:32	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		06/30/17 04:32	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		06/30/17 04:32	95-49-8	
2-Hexanone	0.21J	ug/L	5.0	0.19	1		06/30/17 04:32	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		06/30/17 04:32	106-43-4	
4-Methyl-2-pentanone (MIBK)	2.3J	ug/L	5.0	0.80	1		06/30/17 04:32	108-10-1	
Acetone	9.2J	ug/L	20.0	0.64	1		06/30/17 04:32	67-64-1	L1
Acrolein	<2.1	ug/L	10.0	2.1	1		06/30/17 04:32	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		06/30/17 04:32	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		06/30/17 04:32	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		06/30/17 04:32	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		06/30/17 04:32	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		06/30/17 04:32	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		06/30/17 04:32	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		06/30/17 04:32	74-83-9	CL
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		06/30/17 04:32	75-15-0	
Carbon tetrachloride	2.1	ug/L	0.50	0.079	1		06/30/17 04:32	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		06/30/17 04:32	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		06/30/17 04:32	75-00-3	
Chloroform	0.26J	ug/L	1.0	0.21	1		06/30/17 04:32	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		06/30/17 04:32	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		06/30/17 04:32	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

**Sample: MW15D-GW-20-062617**    **Lab ID: 10393917001**    Collected: 06/26/17 15:15    Received: 06/28/17 09:50    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		06/30/17 04:32	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		06/30/17 04:32	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		06/30/17 04:32	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		06/30/17 04:32	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		06/30/17 04:32	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		06/30/17 04:32	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		06/30/17 04:32	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		06/30/17 04:32	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		06/30/17 04:32	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		06/30/17 04:32	75-09-2	
Naphthalene	<0.064	ug/L	1.0	0.064	1		06/30/17 04:32	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		06/30/17 04:32	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		06/30/17 04:32	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		06/30/17 04:32	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		06/30/17 04:32	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		06/30/17 04:32	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		06/30/17 04:32	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		06/30/17 04:32	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		06/30/17 04:32	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		06/30/17 04:32	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		06/30/17 04:32	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		06/30/17 04:32	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		06/30/17 04:32	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		06/30/17 04:32	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		06/30/17 04:32	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		06/30/17 04:32	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		06/30/17 04:32	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		06/30/17 04:32	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		06/30/17 04:32	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		06/30/17 04:32	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		06/30/17 04:32	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		06/30/17 04:32	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		06/30/17 04:32	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		06/30/17 04:32	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		06/30/17 04:32	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		06/30/17 04:32	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		06/30/17 04:32	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393917

QC Batch: 482449 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10393917001

METHOD BLANK: 2627820 Matrix: Water  
Associated Lab Samples: 10393917001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	06/29/17 23:06	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	06/29/17 23:06	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	06/29/17 23:06	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	06/29/17 23:06	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	06/29/17 23:06	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	06/29/17 23:06	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	06/29/17 23:06	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	06/29/17 23:06	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	06/29/17 23:06	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	06/29/17 23:06	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	06/29/17 23:06	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	0.50	0.068	06/29/17 23:06	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	06/29/17 23:06	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	06/29/17 23:06	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	06/29/17 23:06	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	06/29/17 23:06	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	06/29/17 23:06	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	06/29/17 23:06	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	06/29/17 23:06	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	06/29/17 23:06	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	06/29/17 23:06	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	06/29/17 23:06	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	06/29/17 23:06	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	06/29/17 23:06	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	06/29/17 23:06	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	06/29/17 23:06	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	06/29/17 23:06	
2-Hexanone	ug/L	<0.19	5.0	0.19	06/29/17 23:06	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	06/29/17 23:06	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	06/29/17 23:06	
Acetone	ug/L	<0.64	20.0	0.64	06/29/17 23:06	
Acrolein	ug/L	<2.1	10.0	2.1	06/29/17 23:06	
Acrylonitrile	ug/L	<0.49	10.0	0.49	06/29/17 23:06	
Benzene	ug/L	<0.042	0.50	0.042	06/29/17 23:06	
Bromobenzene	ug/L	<0.087	0.50	0.087	06/29/17 23:06	
Bromochloromethane	ug/L	<0.082	1.0	0.082	06/29/17 23:06	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	06/29/17 23:06	
Bromoform	ug/L	<0.11	4.0	0.11	06/29/17 23:06	
Bromomethane	ug/L	<0.20	4.0	0.20	06/29/17 23:06	CL
Carbon disulfide	ug/L	<0.20	1.0	0.20	06/29/17 23:06	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	06/29/17 23:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

METHOD BLANK: 2627820

Matrix: Water

Associated Lab Samples: 10393917001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	06/29/17 23:06	
Chloroethane	ug/L	<0.12	1.0	0.12	06/29/17 23:06	
Chloroform	ug/L	<0.21	1.0	0.21	06/29/17 23:06	
Chloromethane	ug/L	<0.080	4.0	0.080	06/29/17 23:06	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	06/29/17 23:06	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	06/29/17 23:06	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	06/29/17 23:06	
Dibromomethane	ug/L	<0.14	1.0	0.14	06/29/17 23:06	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	06/29/17 23:06	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	06/29/17 23:06	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	06/29/17 23:06	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	06/29/17 23:06	
Ethylbenzene	ug/L	<0.075	0.50	0.075	06/29/17 23:06	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	06/29/17 23:06	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	06/29/17 23:06	
m&p-Xylene	ug/L	<0.11	1.0	0.11	06/29/17 23:06	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	06/29/17 23:06	
Methylene Chloride	ug/L	<0.097	4.0	0.097	06/29/17 23:06	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	06/29/17 23:06	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	06/29/17 23:06	
Naphthalene	ug/L	<0.064	1.0	0.064	06/29/17 23:06	
o-Xylene	ug/L	<0.044	0.50	0.044	06/29/17 23:06	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	06/29/17 23:06	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	06/29/17 23:06	
Styrene	ug/L	<0.056	0.50	0.056	06/29/17 23:06	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	06/29/17 23:06	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	06/29/17 23:06	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	06/29/17 23:06	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	06/29/17 23:06	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	06/29/17 23:06	
Toluene	ug/L	<0.059	0.50	0.059	06/29/17 23:06	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	06/29/17 23:06	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	06/29/17 23:06	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	06/29/17 23:06	
Trichloroethene	ug/L	<0.044	0.40	0.044	06/29/17 23:06	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	06/29/17 23:06	
Vinyl acetate	ug/L	<0.12	10.0	0.12	06/29/17 23:06	
Vinyl chloride	ug/L	<0.098	0.20	0.098	06/29/17 23:06	
Xylene (Total)	ug/L	<0.15	1.5	0.15	06/29/17 23:06	
1,2-Dichloroethane-d4 (S)	%	106	75-137		06/29/17 23:06	
4-Bromofluorobenzene (S)	%	97	75-125		06/29/17 23:06	
Toluene-d8 (S)	%	100	75-125		06/29/17 23:06	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

LABORATORY CONTROL SAMPLE & LCSD: 2627821		2627822									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	20.5	110	103	75-136	6	30		
1,1,1-Trichloroethane	ug/L	20	20.8	20.5	104	103	75-129	1	30		
1,1,2,2-Tetrachloroethane	ug/L	20	22.1	20.8	110	104	71-138	6	30		
1,1,2-Trichloroethane	ug/L	20	22.7	21.3	114	106	75-125	7	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.5	21.1	107	106	69-126	2	30		
1,1-Dichloroethane	ug/L	20	21.0	20.7	105	103	75-125	1	30		
1,1-Dichloroethene	ug/L	20	21.1	21.2	105	106	75-125	1	30		
1,1-Dichloropropene	ug/L	20	20.7	20.3	104	101	75-125	2	30		
1,2,3-Trichlorobenzene	ug/L	20	18.9	19.1	94	95	75-125	1	30		
1,2,3-Trichloropropane	ug/L	20	21.6	20.5	108	103	75-125	5	30		
1,2,4-Trichlorobenzene	ug/L	20	19.1	19.2	95	96	75-125	0	30		
1,2,4-Trimethylbenzene	ug/L	20	20.1	19.4	100	97	75-125	4	30		
1,2-Dibromo-3-chloropropane	ug/L	50	47.6	45.2	95	90	71-130	5	30		
1,2-Dibromoethane (EDB)	ug/L	20	22.4	21.5	112	107	75-125	4	30		
1,2-Dichlorobenzene	ug/L	20	20.3	19.0	102	95	75-125	7	30		
1,2-Dichloroethane	ug/L	20	21.2	20.3	106	102	70-125	4	30		
1,2-Dichloroethene (Total)	ug/L	40	41.2	39.6	103	99	75-125	4	30		
1,2-Dichloropropane	ug/L	20	21.4	20.2	107	101	75-125	6	30		
1,3,5-Trimethylbenzene	ug/L	20	19.7	19.2	98	96	75-125	2	30		
1,3-Dichlorobenzene	ug/L	20	21.0	20.5	105	102	75-125	2	30		
1,3-Dichloropropane	ug/L	20	21.8	20.8	109	104	75-125	4	30		
1,4-Dichlorobenzene	ug/L	20	19.7	19.1	99	96	75-125	3	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	392	432	98	108	64-140	10	30		
2,2,4-Trimethylpentane	ug/L	20	19.2	19.1	96	96	68-125	1	30		
2,2-Dichloropropane	ug/L	20	19.3	19.3	96	97	70-131	0	30		
2-Butanone (MEK)	ug/L	100	100	93.5	100	94	69-125	7	30		
2-Chlorotoluene	ug/L	20	20.0	19.1	100	96	75-125	5	30		
2-Hexanone	ug/L	100	107	101	107	101	73-129	6	30		
4-Chlorotoluene	ug/L	20	20.8	19.8	104	99	75-125	5	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	103	110	103	73-125	7	30		
Acetone	ug/L	100	135	114	135	114	66-126	17	30	L1	
Acrolein	ug/L	200	253	239	127	120	56-150	6	30		
Acrylonitrile	ug/L	200	207	196	104	98	68-129	5	30		
Benzene	ug/L	20	19.8	19.7	99	99	75-125	1	30		
Bromobenzene	ug/L	20	21.2	20.2	106	101	75-125	5	30		
Bromochloromethane	ug/L	20	22.2	21.1	111	106	75-126	5	30		
Bromodichloromethane	ug/L	20	22.1	21.4	111	107	75-133	3	30		
Bromoform	ug/L	20	18.5	18.2	93	91	62-142	2	30		
Bromomethane	ug/L	20	10.5	11.9	53	59	34-143	12	30	CL	
Carbon disulfide	ug/L	20	21.0	20.8	105	104	71-125	1	30		
Carbon tetrachloride	ug/L	20	20.6	20.6	103	103	71-145	0	30		
Chlorobenzene	ug/L	20	20.6	19.8	103	99	75-125	4	30		
Chloroethane	ug/L	20	23.1	23.1	115	116	75-125	0	30		
Chloroform	ug/L	20	20.1	19.5	101	98	75-125	3	30		
Chloromethane	ug/L	20	15.4	15.1	77	76	54-125	2	30		
cis-1,2-Dichloroethene	ug/L	20	20.6	19.7	103	98	75-125	5	30		
cis-1,3-Dichloropropene	ug/L	20	20.8	20.0	104	100	75-125	4	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

LABORATORY CONTROL SAMPLE & LCSD: 2627821		2627822								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	21.7	20.2	108	101	74-141	7	30	
Dibromomethane	ug/L	20	21.8	20.9	109	105	75-125	4	30	
Dichlorodifluoromethane	ug/L	20	23.7	23.7	119	119	59-130	0	30	
Dichlorofluoromethane	ug/L	20	21.5	21.0	108	105	75-125	2	30	
Diisopropyl ether	ug/L	20	20.6	20.2	103	101	69-125	2	30	
Ethyl-tert-butyl ether	ug/L	20	21.1	20.1	105	100	73-125	5	30	
Ethylbenzene	ug/L	20	19.6	19.3	98	97	75-125	2	30	
Hexachloro-1,3-butadiene	ug/L	20	19.5	20.5	98	103	75-131	5	30	
Isopropylbenzene (Cumene)	ug/L	20	19.9	19.9	100	99	75-125	0	30	
m&p-Xylene	ug/L	40	40.5	39.3	101	98	75-125	3	30	
Methyl-tert-butyl ether	ug/L	20	21.3	20.5	106	102	75-125	4	30	
Methylene Chloride	ug/L	20	21.1	20.1	106	101	73-125	5	30	
n-Butylbenzene	ug/L	20	20.6	20.8	103	104	75-125	1	30	
n-Propylbenzene	ug/L	20	19.8	19.3	99	97	75-125	3	30	
Naphthalene	ug/L	20	18.2	18.4	91	92	74-125	1	30	
o-Xylene	ug/L	20	20.7	19.8	104	99	75-125	5	30	
p-Isopropyltoluene	ug/L	20	20.0	20.0	100	100	75-125	0	30	
sec-Butylbenzene	ug/L	20	19.9	20.0	100	100	75-125	0	30	
Styrene	ug/L	20	21.3	20.2	107	101	75-125	5	30	
tert-Amylmethyl ether	ug/L	20	20.6	19.9	103	100	71-126	3	30	
tert-Butyl Alcohol	ug/L	200	196	216	98	108	69-131	10	30	
tert-Butylbenzene	ug/L	20	19.2	19.0	96	95	75-125	1	30	
Tetrachloroethene	ug/L	20	20.6	20.3	103	101	75-125	1	30	
Tetrahydrofuran	ug/L	200	249	209	124	105	65-127	17	30	
Toluene	ug/L	20	20.5	19.7	103	99	75-125	4	30	
trans-1,2-Dichloroethene	ug/L	20	20.6	19.9	103	100	75-125	3	30	
trans-1,3-Dichloropropene	ug/L	20	20.7	19.8	103	99	75-125	4	30	
trans-1,4-Dichloro-2-butene	ug/L	50	43.6	38.9	87	78	30-150	11	30	
Trichloroethene	ug/L	20	20.6	20.2	103	101	75-125	2	30	
Trichlorofluoromethane	ug/L	20	22.5	22.4	113	112	71-140	1	30	
Vinyl acetate	ug/L	20	24.4	23.1	122	115	68-137	6	30	
Vinyl chloride	ug/L	20	22.1	22.0	110	110	70-125	1	30	
Xylene (Total)	ug/L	60	61.3	59.1	102	98	75-125	4	30	
1,2-Dichloroethane-d4 (S)	%				99	100	75-137			
4-Bromofluorobenzene (S)	%				100	99	75-125			
Toluene-d8 (S)	%				101	101	75-125			

MATRIX SPIKE SAMPLE: 2627823		1290523001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result					
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.7	98	75-137	
1,1,1-Trichloroethane	ug/L	ND	20	20.5	102	75-139	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.6	98	60-142	
1,1,2-Trichloroethane	ug/L	ND	20	20.1	101	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	22.2	111	62-150	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

MATRIX SPIKE SAMPLE: 2627823		1290523001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	ND	20	20.2	101	70-129	
1,1-Dichloroethene	ug/L	ND	20	21.4	107	67-141	
1,1-Dichloropropene	ug/L	ND	20	20.2	101	64-144	
1,2,3-Trichlorobenzene	ug/L	ND	20	18.6	93	66-139	
1,2,3-Trichloropropane	ug/L	ND	20	18.6	93	69-134	
1,2,4-Trichlorobenzene	ug/L	ND	20	18.0	90	65-138	
1,2,4-Trimethylbenzene	ug/L	ND	20	18.5	93	65-143	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	42.3	85	61-134	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20.0	100	74-129	
1,2-Dichlorobenzene	ug/L	ND	20	17.8	89	68-135	
1,2-Dichloroethane	ug/L	ND	20	19.2	96	73-125	
1,2-Dichloroethene (Total)	ug/L	ND	40	39.5	99	69-134	
1,2-Dichloropropane	ug/L	ND	20	19.3	96	64-130	
1,3,5-Trimethylbenzene	ug/L	ND	20	18.7	93	64-146	
1,3-Dichlorobenzene	ug/L	ND	20	19.1	95	69-135	
1,3-Dichloropropane	ug/L	ND	20	19.3	97	67-128	
1,4-Dichlorobenzene	ug/L	ND	20	18.1	90	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	368	92	58-140	
2,2,4-Trimethylpentane	ug/L	ND	20	20.0	100	48-150	
2,2-Dichloropropane	ug/L	ND	20	19.1	96	50-150	
2-Butanone (MEK)	ug/L	ND	100	85.3	85	58-125	
2-Chlorotoluene	ug/L	ND	20	18.5	92	65-138	
2-Hexanone	ug/L	ND	100	93.8	94	61-134	
4-Chlorotoluene	ug/L	ND	20	18.7	94	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	92.1	92	61-130	
Acetone	ug/L	ND	100	159	159	51-140	MO
Acrolein	ug/L	ND	200	266	133	48-150	
Acrylonitrile	ug/L	ND	200	187	94	55-134	
Benzene	ug/L	ND	20	19.0	95	63-132	
Bromobenzene	ug/L	ND	20	18.9	94	67-138	
Bromochloromethane	ug/L	ND	20	19.8	99	66-138	
Bromodichloromethane	ug/L	ND	20	20.5	102	75-137	
Bromoform	ug/L	ND	20	16.6	83	65-129	
Bromomethane	ug/L	ND	20	12.1	60	41-150	CL
Carbon disulfide	ug/L	ND	20	20.8	104	72-132	
Carbon tetrachloride	ug/L	ND	20	20.5	102	75-150	
Chlorobenzene	ug/L	ND	20	18.7	94	73-127	
Chloroethane	ug/L	ND	20	21.3	107	74-138	
Chloroform	ug/L	ND	20	18.7	94	74-125	
Chloromethane	ug/L	ND	20	14.1	70	58-129	
cis-1,2-Dichloroethene	ug/L	ND	20	19.3	97	63-135	
cis-1,3-Dichloropropene	ug/L	ND	20	18.3	92	66-129	
Dibromochloromethane	ug/L	ND	20	19.0	95	75-133	
Dibromomethane	ug/L	ND	20	19.7	98	68-134	
Dichlorodifluoromethane	ug/L	ND	20	24.0	120	72-150	
Dichlorofluoromethane	ug/L	ND	20	20.0	100	75-129	
Diisopropyl ether	ug/L	ND	20	18.9	95	62-128	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

MATRIX SPIKE SAMPLE: 2627823

Parameter	Units	1290523001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	ND	20	18.8	94	63-132	
Ethylbenzene	ug/L	ND	20	18.3	92	72-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	20.0	100	71-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	18.7	94	70-136	
m&p-Xylene	ug/L	ND	40	37.6	94	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	19.5	97	72-125	
Methylene Chloride	ug/L	ND	20	18.7	93	60-132	
n-Butylbenzene	ug/L	ND	20	20.0	100	60-150	
n-Propylbenzene	ug/L	ND	20	18.6	93	63-142	
Naphthalene	ug/L	ND	20	17.4	87	67-125	
o-Xylene	ug/L	ND	20	18.7	93	60-143	
p-Isopropyltoluene	ug/L	ND	20	18.9	95	64-146	
sec-Butylbenzene	ug/L	ND	20	19.0	95	67-144	
Styrene	ug/L	ND	20	18.9	94	67-136	
tert-Amylmethyl ether	ug/L	ND	20	18.4	92	60-134	
tert-Butyl Alcohol	ug/L	ND	200	187	94	56-146	
tert-Butylbenzene	ug/L	ND	20	18.3	92	68-135	
Tetrachloroethene	ug/L	ND	20	19.2	96	67-148	
Tetrahydrofuran	ug/L	ND	200	271	135	51-141	
Toluene	ug/L	ND	20	19.6	98	61-140	
trans-1,2-Dichloroethene	ug/L	ND	20	20.1	101	62-138	
trans-1,3-Dichloropropene	ug/L	ND	20	17.9	90	67-134	
trans-1,4-Dichloro-2-butene	ug/L	ND	50	36.9	74	30-150	
Trichloroethene	ug/L	ND	20	20.2	101	64-149	
Trichlorofluoromethane	ug/L	ND	20	22.0	110	75-150	
Vinyl acetate	ug/L	ND	20	20.8	104	49-143	
Vinyl chloride	ug/L	ND	20	21.4	107	75-133	
Xylene (Total)	ug/L	ND	60	56.2	94	63-142	
1,2-Dichloroethane-d4 (S)	%				102	75-137	
4-Bromofluorobenzene (S)	%				100	75-125	
Toluene-d8 (S)	%				99	75-125	

SAMPLE DUPLICATE: 2627824

Parameter	Units	1290523002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	<0.064		30	
1,1,1-Trichloroethane	ug/L	ND	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	<0.055		30	
1,1,2-Trichloroethane	ug/L	ND	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	<0.13		30	
1,1-Dichloroethane	ug/L	ND	<0.055		30	
1,1-Dichloroethene	ug/L	ND	<0.069		30	
1,1-Dichloropropene	ug/L	ND	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	ND	<0.17		30	
1,2,3-Trichloropropane	ug/L	ND	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

SAMPLE DUPLICATE: 2627824

Parameter	Units	1290523002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	ND	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	ND	<0.092		30	
1,2-Dichlorobenzene	ug/L	ND	<0.078		30	
1,2-Dichloroethane	ug/L	ND	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	ND	<0.16		30	
1,2-Dichloropropane	ug/L	ND	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	ND	<0.042		30	
1,3-Dichlorobenzene	ug/L	ND	<0.085		30	
1,3-Dichloropropane	ug/L	ND	<0.059		30	
1,4-Dichlorobenzene	ug/L	ND	0.23J		30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	<4.8		30	
2,2,4-Trimethylpentane	ug/L	ND	<0.087		30	
2,2-Dichloropropane	ug/L	ND	<0.096		30	
2-Butanone (MEK)	ug/L	ND	<1.1		30	
2-Chlorotoluene	ug/L	ND	<0.084		30	
2-Hexanone	ug/L	ND	<0.19		30	
4-Chlorotoluene	ug/L	ND	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	<0.80		30	
Acetone	ug/L	ND	5.3J		30	
Acrolein	ug/L	ND	<2.1		30	
Acrylonitrile	ug/L	ND	<0.49		30	
Benzene	ug/L	ND	<0.042		30	
Bromobenzene	ug/L	ND	<0.087		30	
Bromochloromethane	ug/L	ND	<0.082		30	
Bromodichloromethane	ug/L	ND	<0.068		30	
Bromoform	ug/L	ND	<0.11		30	
Bromomethane	ug/L	ND	<0.20		30	CL
Carbon disulfide	ug/L	ND	<0.20		30	
Carbon tetrachloride	ug/L	ND	<0.079		30	
Chlorobenzene	ug/L	ND	<0.066		30	
Chloroethane	ug/L	ND	<0.12		30	
Chloroform	ug/L	ND	<0.21		30	
Chloromethane	ug/L	ND	<0.080		30	
cis-1,2-Dichloroethene	ug/L	ND	<0.12		30	
cis-1,3-Dichloropropene	ug/L	ND	<0.069		30	
Dibromochloromethane	ug/L	ND	<0.048		30	
Dibromomethane	ug/L	ND	<0.14		30	
Dichlorodifluoromethane	ug/L	ND	<0.075		30	
Dichlorofluoromethane	ug/L	ND	<0.054		30	
Diisopropyl ether	ug/L	ND	<0.050		30	
Ethyl-tert-butyl ether	ug/L	ND	<0.062		30	
Ethylbenzene	ug/L	ND	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	ND	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	ND	<0.064		30	
m&p-Xylene	ug/L	ND	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

SAMPLE DUPLICATE: 2627824

Parameter	Units	1290523002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	ND	<0.047		30	
Methylene Chloride	ug/L	ND	<0.097		30	
n-Butylbenzene	ug/L	ND	<0.16		30	
n-Propylbenzene	ug/L	ND	<0.049		30	
Naphthalene	ug/L	ND	<0.064		30	
o-Xylene	ug/L	ND	<0.044		30	
p-Isopropyltoluene	ug/L	ND	<0.064		30	
sec-Butylbenzene	ug/L	ND	<0.094		30	
Styrene	ug/L	ND	<0.056		30	
tert-Amylmethyl ether	ug/L	ND	<0.073		30	
tert-Butyl Alcohol	ug/L	ND	<0.89		30	
tert-Butylbenzene	ug/L	ND	<0.051		30	
Tetrachloroethene	ug/L	ND	<0.13		30	
Tetrahydrofuran	ug/L	ND	<1.5		30	
Toluene	ug/L	ND	<0.059		30	
trans-1,2-Dichloroethene	ug/L	ND	<0.15		30	
trans-1,3-Dichloropropene	ug/L	ND	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	<0.45		30	
Trichloroethene	ug/L	ND	<0.044		30	
Trichlorofluoromethane	ug/L	ND	<0.055		30	
Vinyl acetate	ug/L	ND	<0.12		30	
Vinyl chloride	ug/L	ND	<0.098		30	
Xylene (Total)	ug/L	ND	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	104	105	1		
4-Bromofluorobenzene (S)	%	102	101	2		
Toluene-d8 (S)	%	99	99	0		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393917

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 482449

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.  
L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.  
M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman Rev

Pace Project No.: 10393917

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman Rev  
Pace Project No.: 10393917

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10393917001	MW15D-GW-20-062617	EPA 8260B	482449		

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### REPORT OF LABORATORY ANALYSIS

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10393917

Section A  
Required Client Information:

Section B  
Required Project Information:

Section C  
Invoice Information:

Page: 1 of 1

Company: CH2M Hill	Report To: Mark Ochser, Brad Ostapkowicz	Attention: Anne Theriault
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Requested Due Date: <b>5 DAY Max: TAT</b> <del>30 Day Standard</del>	Project Name: UPRR Freeman	Pace Project Manager: Jennifer Gross
	Project #: 1497	Pace Profile #: 36447 / 4

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analyses Test Y/N	Requested Analysis Filtered (Y/N)															
				DATE	TIME	DATE	TIME					Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS		TOC 8310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4
1	MWISU-GW-20-062617	WT	G	6/24/17	1515	6/26/17	1515	-	3			X	X														001
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											


ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	<i>[Signature]</i> CH2M HILL	6-27-17	1400	<i>[Signature]</i> FedEx	6-27-17	1400	
*Field filtered by client				<i>[Signature]</i> RACE	6-28-17	1904.3	Y Y Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<i>[Signature]</i>				
SIGNATURE of SAMPLER:	<i>[Signature]</i>				
	DATE Signed: 6-27-17				

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M Hill VARR Project #: \_\_\_\_\_

**WO#: 10393917**



10393917

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 7222 2739 8621

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 4.3 Cooler Temp Corrected (°C): 4.3 Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: TRITE Date and Initials of Person Examining Contents: ME 6-28-17

USDA Regulated Soil?  N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1250</u>	Temp: <u>4.3</u>	Corrected Temp: <u>4.3</u>
Time: _____	put in cooler	
Time: <u>1254</u>	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNIFER GROSS

Date: 06/28/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 10, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

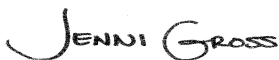
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10394792

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on July 07, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10394792001	MW21D-GW-20-070517	Water	07/05/17 11:15	07/07/17 08:45

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10394792001	MW21D-GW-20-070517	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 10, 2017

**General Information:**

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 483781

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

**Sample: MW21D-GW-20-070517**    **Lab ID: 10394792001**    Collected: 07/05/17 11:15    Received: 07/07/17 08:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/08/17 22:16	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/08/17 22:16	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/08/17 22:16	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/08/17 22:16	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/08/17 22:16	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/08/17 22:16	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/08/17 22:16	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/08/17 22:16	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/08/17 22:16	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/08/17 22:16	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/08/17 22:16	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/08/17 22:16	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/08/17 22:16	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/08/17 22:16	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/08/17 22:16	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/08/17 22:16	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/08/17 22:16	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/08/17 22:16	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/08/17 22:16	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/08/17 22:16	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/08/17 22:16	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/08/17 22:16	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/08/17 22:16	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/08/17 22:16	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/08/17 22:16	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/08/17 22:16	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/08/17 22:16	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/08/17 22:16	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/08/17 22:16	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/08/17 22:16	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		07/08/17 22:16	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/08/17 22:16	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/08/17 22:16	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/08/17 22:16	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/08/17 22:16	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/08/17 22:16	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/08/17 22:16	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/08/17 22:16	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/08/17 22:16	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		07/08/17 22:16	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		07/08/17 22:16	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/08/17 22:16	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/08/17 22:16	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		07/08/17 22:16	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/08/17 22:16	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/08/17 22:16	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Project No.: 10394792

Sample: MW21D-GW-20-070517 Lab ID: 10394792001 Collected: 07/05/17 11:15 Received: 07/07/17 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/08/17 22:16	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/08/17 22:16	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/08/17 22:16	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/08/17 22:16	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/08/17 22:16	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/08/17 22:16	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/08/17 22:16	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/08/17 22:16	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/08/17 22:16	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		07/08/17 22:16	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/08/17 22:16	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/08/17 22:16	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/08/17 22:16	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/08/17 22:16	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/08/17 22:16	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/08/17 22:16	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/08/17 22:16	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/08/17 22:16	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/08/17 22:16	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/08/17 22:16	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/08/17 22:16	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/08/17 22:16	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/08/17 22:16	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/08/17 22:16	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/08/17 22:16	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/08/17 22:16	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/08/17 22:16	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/08/17 22:16	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/08/17 22:16	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/08/17 22:16	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/08/17 22:16	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/08/17 22:16	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/08/17 22:16	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/08/17 22:16	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	109	%	75-137		1		07/08/17 22:16	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		07/08/17 22:16	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		07/08/17 22:16	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10394792

QC Batch: 483781 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10394792001

METHOD BLANK: 2634268 Matrix: Water  
Associated Lab Samples: 10394792001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	07/08/17 17:12	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	07/08/17 17:12	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	07/08/17 17:12	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	07/08/17 17:12	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	07/08/17 17:12	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	07/08/17 17:12	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	07/08/17 17:12	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	07/08/17 17:12	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	07/08/17 17:12	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	07/08/17 17:12	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	07/08/17 17:12	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	1.0	0.068	07/08/17 17:12	MN
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	07/08/17 17:12	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	07/08/17 17:12	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	07/08/17 17:12	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	07/08/17 17:12	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	07/08/17 17:12	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	07/08/17 17:12	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	07/08/17 17:12	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	07/08/17 17:12	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	07/08/17 17:12	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	07/08/17 17:12	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	07/08/17 17:12	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	07/08/17 17:12	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	07/08/17 17:12	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	07/08/17 17:12	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	07/08/17 17:12	
2-Hexanone	ug/L	<0.19	5.0	0.19	07/08/17 17:12	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	07/08/17 17:12	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	07/08/17 17:12	
Acetone	ug/L	<0.64	20.0	0.64	07/08/17 17:12	
Acrolein	ug/L	<2.1	10.0	2.1	07/08/17 17:12	
Acrylonitrile	ug/L	<0.49	10.0	0.49	07/08/17 17:12	
Benzene	ug/L	<0.042	0.50	0.042	07/08/17 17:12	
Bromobenzene	ug/L	<0.087	0.50	0.087	07/08/17 17:12	
Bromochloromethane	ug/L	<0.082	1.0	0.082	07/08/17 17:12	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	07/08/17 17:12	
Bromoform	ug/L	<0.11	4.0	0.11	07/08/17 17:12	
Bromomethane	ug/L	<0.20	4.0	0.20	07/08/17 17:12	
Carbon disulfide	ug/L	<0.20	1.0	0.20	07/08/17 17:12	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	07/08/17 17:12	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10394792

METHOD BLANK: 2634268 Matrix: Water  
Associated Lab Samples: 10394792001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	07/08/17 17:12	
Chloroethane	ug/L	<0.12	1.0	0.12	07/08/17 17:12	
Chloroform	ug/L	<0.21	1.0	0.21	07/08/17 17:12	
Chloromethane	ug/L	<0.080	4.0	0.080	07/08/17 17:12	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	07/08/17 17:12	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	07/08/17 17:12	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	07/08/17 17:12	
Dibromomethane	ug/L	<0.14	1.0	0.14	07/08/17 17:12	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	07/08/17 17:12	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	07/08/17 17:12	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	07/08/17 17:12	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	07/08/17 17:12	
Ethylbenzene	ug/L	<0.075	0.50	0.075	07/08/17 17:12	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	07/08/17 17:12	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	07/08/17 17:12	
m&p-Xylene	ug/L	<0.11	1.0	0.11	07/08/17 17:12	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	07/08/17 17:12	
Methylene Chloride	ug/L	<0.097	4.0	0.097	07/08/17 17:12	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	07/08/17 17:12	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	07/08/17 17:12	
Naphthalene	ug/L	<0.064	4.0	0.064	07/08/17 17:12	MN
o-Xylene	ug/L	<0.044	0.50	0.044	07/08/17 17:12	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	07/08/17 17:12	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	07/08/17 17:12	
Styrene	ug/L	<0.056	0.50	0.056	07/08/17 17:12	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	07/08/17 17:12	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	07/08/17 17:12	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	07/08/17 17:12	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	07/08/17 17:12	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	07/08/17 17:12	
Toluene	ug/L	<0.059	0.50	0.059	07/08/17 17:12	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	07/08/17 17:12	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	07/08/17 17:12	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	07/08/17 17:12	
Trichloroethene	ug/L	<0.044	0.40	0.044	07/08/17 17:12	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	07/08/17 17:12	
Vinyl acetate	ug/L	<0.12	10.0	0.12	07/08/17 17:12	
Vinyl chloride	ug/L	<0.098	0.20	0.098	07/08/17 17:12	
Xylene (Total)	ug/L	<0.15	1.5	0.15	07/08/17 17:12	
1,2-Dichloroethane-d4 (S)	%	104	75-137		07/08/17 17:12	
4-Bromofluorobenzene (S)	%	102	75-125		07/08/17 17:12	
Toluene-d8 (S)	%	101	75-125		07/08/17 17:12	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

LABORATORY CONTROL SAMPLE & LCSD: 2634269		2636029									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.8	20.6	104	103	75-136	1	30		
1,1,1-Trichloroethane	ug/L	20	19.9	19.0	99	95	75-129	5	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.7	21.3	104	106	71-138	2	30		
1,1,2-Trichloroethane	ug/L	20	20.2	20.6	101	103	75-125	2	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.0	18.2	95	91	69-126	4	30		
1,1-Dichloroethane	ug/L	20	20.2	19.3	101	97	75-125	4	30		
1,1-Dichloroethene	ug/L	20	19.5	19.1	97	95	75-125	2	30		
1,1-Dichloropropene	ug/L	20	20.8	18.7	104	94	75-125	10	30		
1,2,3-Trichlorobenzene	ug/L	20	18.3	20.2	92	101	75-125	10	30		
1,2,3-Trichloropropane	ug/L	20	20.1	20.1	101	101	75-125	0	30		
1,2,4-Trichlorobenzene	ug/L	20	18.7	19.0	94	95	75-125	2	30		
1,2,4-Trimethylbenzene	ug/L	20	18.8	18.9	94	94	75-125	1	30		
1,2-Dibromo-3-chloropropane	ug/L	50	43.4	49.7	87	99	71-130	13	30		
1,2-Dibromoethane (EDB)	ug/L	20	18.9	20.1	95	101	75-125	6	30		
1,2-Dichlorobenzene	ug/L	20	19.2	19.8	96	99	75-125	3	30		
1,2-Dichloroethane	ug/L	20	19.0	19.1	95	96	70-125	1	30		
1,2-Dichloroethene (Total)	ug/L	40	38.4	38.4	96	96	75-125	0	30		
1,2-Dichloropropane	ug/L	20	20.5	19.3	102	96	75-125	6	30		
1,3,5-Trimethylbenzene	ug/L	20	20.3	20.2	101	101	75-125	1	30		
1,3-Dichlorobenzene	ug/L	20	18.8	19.3	94	97	75-125	3	30		
1,3-Dichloropropane	ug/L	20	21.5	20.4	107	102	75-125	5	30		
1,4-Dichlorobenzene	ug/L	20	18.6	18.8	93	94	75-125	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	329	412	82	103	64-140	22	30		
2,2,4-Trimethylpentane	ug/L	20	19.5	19.8	98	99	68-125	2	30		
2,2-Dichloropropane	ug/L	20	19.5	18.5	98	93	70-131	5	30		
2-Butanone (MEK)	ug/L	100	89.0	89.9	89	90	69-125	1	30		
2-Chlorotoluene	ug/L	20	18.8	19.1	94	96	75-125	2	30		
2-Hexanone	ug/L	100	100	101	100	101	73-129	1	30		
4-Chlorotoluene	ug/L	20	20.0	20.3	100	102	75-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	101	103	101	103	73-125	2	30		
Acetone	ug/L	100	104	86.5	104	87	66-126	18	30		
Acrolein	ug/L	200	189	211	95	106	56-150	11	30		
Acrylonitrile	ug/L	200	187	191	93	96	68-129	2	30		
Benzene	ug/L	20	18.4	18.5	92	92	75-125	0	30		
Bromobenzene	ug/L	20	18.9	19.0	94	95	75-125	0	30		
Bromochloromethane	ug/L	20	19.3	20.7	97	104	75-126	7	30		
Bromodichloromethane	ug/L	20	20.0	20.0	100	100	75-133	0	30		
Bromoform	ug/L	20	20.1	19.8	100	99	62-142	1	30		
Bromomethane	ug/L	20	16.9	18.5	85	93	34-143	9	30		
Carbon disulfide	ug/L	20	18.3	18.2	92	91	71-125	0	30		
Carbon tetrachloride	ug/L	20	19.9	19.4	100	97	71-145	3	30		
Chlorobenzene	ug/L	20	18.7	18.6	94	93	75-125	1	30		
Chloroethane	ug/L	20	20.5	20.1	103	101	75-125	2	30		
Chloroform	ug/L	20	18.3	18.1	91	91	75-125	1	30		
Chloromethane	ug/L	20	20.2	20.7	101	103	54-125	2	30		
cis-1,2-Dichloroethene	ug/L	20	19.9	19.5	100	98	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	20	21.1	19.9	105	99	75-125	6	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

LABORATORY CONTROL SAMPLE & LCSD: 2634269		2636029								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.5	21.4	103	107	74-141	4	30	
Dibromomethane	ug/L	20	18.6	18.8	93	94	75-125	1	30	
Dichlorodifluoromethane	ug/L	20	18.6	17.6	93	88	59-130	5	30	
Dichlorofluoromethane	ug/L	20	19.5	19.3	97	96	75-125	1	30	
Diisopropyl ether	ug/L	20	17.7	19.2	88	96	69-125	8	30	
Ethyl-tert-butyl ether	ug/L	20	18.7	20.7	93	103	73-125	10	30	
Ethylbenzene	ug/L	20	19.7	18.3	99	92	75-125	7	30	
Hexachloro-1,3-butadiene	ug/L	20	21.6	20.5	108	102	75-131	5	30	
Isopropylbenzene (Cumene)	ug/L	20	21.0	19.8	105	99	75-125	6	30	
m&p-Xylene	ug/L	40	42.5	39.7	106	99	75-125	7	30	
Methyl-tert-butyl ether	ug/L	20	19.2	20.0	96	100	75-125	4	30	
Methylene Chloride	ug/L	20	19.2	19.7	96	98	73-125	2	30	
n-Butylbenzene	ug/L	20	21.7	20.8	108	104	75-125	4	30	
n-Propylbenzene	ug/L	20	20.0	19.1	100	95	75-125	5	30	
Naphthalene	ug/L	20	16.6	19.0	83	95	74-125	13	30	
o-Xylene	ug/L	20	20.1	19.9	100	99	75-125	1	30	
p-Isopropyltoluene	ug/L	20	22.3	20.6	111	103	75-125	8	30	
sec-Butylbenzene	ug/L	20	21.3	20.7	107	103	75-125	3	30	
Styrene	ug/L	20	20.1	20.0	101	100	75-125	1	30	
tert-Amylmethyl ether	ug/L	20	17.7	19.9	89	100	71-126	12	30	
tert-Butyl Alcohol	ug/L	200	191	202	96	101	69-131	6	30	
tert-Butylbenzene	ug/L	20	20.4	20.0	102	100	75-125	2	30	
Tetrachloroethene	ug/L	20	19.0	18.6	95	93	75-125	2	30	
Tetrahydrofuran	ug/L	200	218	212	109	106	65-127	3	30	
Toluene	ug/L	20	19.2	18.7	96	93	75-125	3	30	
trans-1,2-Dichloroethene	ug/L	20	18.5	18.9	93	94	75-125	2	30	
trans-1,3-Dichloropropene	ug/L	20	21.4	20.7	107	104	75-125	3	30	
trans-1,4-Dichloro-2-butene	ug/L	50	44.8	48.1	90	96	30-150	7	30	
Trichloroethene	ug/L	20	20.5	19.3	103	96	75-125	6	30	
Trichlorofluoromethane	ug/L	20	20.1	18.1	100	91	71-140	10	30	
Vinyl acetate	ug/L	20	17.8	19.1	89	95	68-137	7	30	
Vinyl chloride	ug/L	20	19.4	18.9	97	94	70-125	3	30	
Xylene (Total)	ug/L	60	62.5	59.6	104	99	75-125	5	30	
1,2-Dichloroethane-d4 (S)	%				99	98	75-137			
4-Bromofluorobenzene (S)	%				98	103	75-125			
Toluene-d8 (S)	%				101	100	75-125			

MATRIX SPIKE SAMPLE: 2636030		10394504014						
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.3	97	75-137		
1,1,1-Trichloroethane	ug/L	ND	20	19.4	97	75-139		
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.8	94	60-142		
1,1,2-Trichloroethane	ug/L	ND	20	18.2	91	75-128		
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	21.7	108	62-150		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

MATRIX SPIKE SAMPLE: 2636030		10394504014	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	ND	20	19.2	96	70-129	
1,1-Dichloroethene	ug/L	ND	20	20.0	100	67-141	
1,1-Dichloropropene	ug/L	ND	20	20.4	102	64-144	
1,2,3-Trichlorobenzene	ug/L	ND	20	18.8	94	66-139	
1,2,3-Trichloropropane	ug/L	ND	20	18.0	90	69-134	
1,2,4-Trichlorobenzene	ug/L	ND	20	18.1	90	65-138	
1,2,4-Trimethylbenzene	ug/L	ND	20	17.6	88	65-143	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	40.8	82	61-134	
1,2-Dibromoethane (EDB)	ug/L	ND	20	17.7	88	74-129	
1,2-Dichlorobenzene	ug/L	ND	20	17.8	89	68-135	
1,2-Dichloroethane	ug/L	ND	20	17.6	88	73-125	
1,2-Dichloroethene (Total)	ug/L	ND	40	37.5	94	69-134	
1,2-Dichloropropane	ug/L	ND	20	18.9	94	64-130	
1,3,5-Trimethylbenzene	ug/L	ND	20	19.4	97	64-146	
1,3-Dichlorobenzene	ug/L	ND	20	17.7	89	69-135	
1,3-Dichloropropane	ug/L	ND	20	19.3	97	67-128	
1,4-Dichlorobenzene	ug/L	ND	20	17.1	86	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	351	88	58-140	
2,2,4-Trimethylpentane	ug/L	ND	20	22.9	114	48-150	
2,2-Dichloropropane	ug/L	ND	20	20.1	101	50-150	
2-Butanone (MEK)	ug/L	ND	100	76.8	77	58-125	
2-Chlorotoluene	ug/L	ND	20	17.6	88	65-138	
2-Hexanone	ug/L	ND	100	88.4	88	61-134	
4-Chlorotoluene	ug/L	ND	20	18.6	93	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	90.1	90	61-130	
Acetone	ug/L	ND	100	138	127	51-140	
Acrolein	ug/L	ND	200	223	112	48-150	
Acrylonitrile	ug/L	ND	200	173	86	55-134	
Benzene	ug/L	ND	20	17.7	88	63-132	
Bromobenzene	ug/L	ND	20	17.4	87	67-138	
Bromochloromethane	ug/L	ND	20	18.7	93	66-138	
Bromodichloromethane	ug/L	ND	20	18.6	93	75-137	
Bromoform	ug/L	ND	20	18.4	92	65-129	
Bromomethane	ug/L	ND	20	20.3	101	41-150	
Carbon disulfide	ug/L	ND	20	18.2	91	72-132	
Carbon tetrachloride	ug/L	ND	20	20.4	102	75-150	
Chlorobenzene	ug/L	ND	20	17.2	86	73-127	
Chloroethane	ug/L	ND	20	21.6	108	74-138	
Chloroform	ug/L	ND	20	17.0	85	74-125	
Chloromethane	ug/L	ND	20	22.1	111	58-129	
cis-1,2-Dichloroethene	ug/L	ND	20	19.2	96	63-135	
cis-1,3-Dichloropropene	ug/L	ND	20	19.0	95	66-129	
Dibromochloromethane	ug/L	ND	20	18.5	93	75-133	
Dibromomethane	ug/L	ND	20	17.3	86	68-134	
Dichlorodifluoromethane	ug/L	ND	20	22.9	114	72-150	
Dichlorofluoromethane	ug/L	ND	20	20.4	102	75-129	
Diisopropyl ether	ug/L	ND	20	16.5	82	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10394792

MATRIX SPIKE SAMPLE: 2636030		10394504014	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	ND	20	17.3	87	63-132	
Ethylbenzene	ug/L	ND	20	18.4	92	72-130	
Hexachloro-1,3-butadiene	ug/L	ND	20	21.7	108	71-150	
Isopropylbenzene (Cumene)	ug/L	ND	20	20.0	100	70-136	
m&p-Xylene	ug/L	ND	40	39.6	99	64-142	
Methyl-tert-butyl ether	ug/L	ND	20	18.0	90	72-125	
Methylene Chloride	ug/L	ND	20	17.8	89	60-132	
n-Butylbenzene	ug/L	ND	20	21.4	107	60-150	
n-Propylbenzene	ug/L	ND	20	19.1	96	63-142	
Naphthalene	ug/L	ND	20	17.0	85	67-125	
o-Xylene	ug/L	ND	20	19.2	96	60-143	
p-Isopropyltoluene	ug/L	ND	20	21.9	110	64-146	
sec-Butylbenzene	ug/L	ND	20	20.9	105	67-144	
Styrene	ug/L	ND	20	18.4	92	67-136	
tert-Amylmethyl ether	ug/L	ND	20	16.3	82	60-134	
tert-Butyl Alcohol	ug/L	ND	200	186	93	56-146	
tert-Butylbenzene	ug/L	ND	20	19.5	98	68-135	
Tetrachloroethene	ug/L	ND	20	19.1	95	67-148	
Tetrahydrofuran	ug/L	ND	200	288	144	51-141 M1	
Toluene	ug/L	ND	20	17.8	89	61-140	
trans-1,2-Dichloroethene	ug/L	ND	20	18.3	91	62-138	
trans-1,3-Dichloropropene	ug/L	ND	20	19.8	99	67-134	
trans-1,4-Dichloro-2-butene	ug/L	ND	50	42.9	86	30-150	
Trichloroethene	ug/L	ND	20	19.6	98	64-149	
Trichlorofluoromethane	ug/L	ND	20	23.0	115	75-150	
Vinyl acetate	ug/L	ND	20	16.7	83	49-143	
Vinyl chloride	ug/L	ND	20	21.4	107	75-133	
Xylene (Total)	ug/L	ND	60	58.7	98	63-142	
1,2-Dichloroethane-d4 (S)	%				99	75-137	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				99	75-125	

SAMPLE DUPLICATE: 2636031

Parameter	Units	10394504015	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	ND	<0.064		30	
1,1,1-Trichloroethane	ug/L	ND	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	<0.055		30	
1,1,2-Trichloroethane	ug/L	ND	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	<0.13		30	
1,1-Dichloroethane	ug/L	ND	<0.055		30	
1,1-Dichloroethene	ug/L	ND	<0.069		30	
1,1-Dichloropropene	ug/L	ND	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	ND	<0.17		30	
1,2,3-Trichloropropane	ug/L	ND	<0.19		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

SAMPLE DUPLICATE: 2636031

Parameter	Units	10394504015 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	ND	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	ND	<0.092		30	
1,2-Dichlorobenzene	ug/L	ND	<0.078		30	
1,2-Dichloroethane	ug/L	ND	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	ND	<0.16		30	
1,2-Dichloropropane	ug/L	ND	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	ND	<0.042		30	
1,3-Dichlorobenzene	ug/L	ND	<0.085		30	
1,3-Dichloropropane	ug/L	ND	<0.059		30	
1,4-Dichlorobenzene	ug/L	ND	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	<4.8		30	
2,2,4-Trimethylpentane	ug/L	ND	<0.087		30	
2,2-Dichloropropane	ug/L	ND	<0.096		30	
2-Butanone (MEK)	ug/L	ND	<1.1		30	
2-Chlorotoluene	ug/L	ND	<0.084		30	
2-Hexanone	ug/L	ND	<0.19		30	
4-Chlorotoluene	ug/L	ND	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	<0.80		30	
Acetone	ug/L	ND	13.5J		30	
Acrolein	ug/L	ND	<2.1		30	
Acrylonitrile	ug/L	ND	<0.49		30	
Benzene	ug/L	ND	<0.042		30	
Bromobenzene	ug/L	ND	<0.087		30	
Bromochloromethane	ug/L	ND	<0.082		30	
Bromodichloromethane	ug/L	ND	<0.068		30	
Bromoform	ug/L	ND	<0.11		30	
Bromomethane	ug/L	ND	<0.20		30	
Carbon disulfide	ug/L	ND	<0.20		30	
Carbon tetrachloride	ug/L	ND	0.12J		30	
Chlorobenzene	ug/L	ND	<0.066		30	
Chloroethane	ug/L	ND	<0.12		30	
Chloroform	ug/L	ND	<0.21		30	
Chloromethane	ug/L	ND	<0.080		30	
cis-1,2-Dichloroethene	ug/L	ND	<0.12		30	
cis-1,3-Dichloropropene	ug/L	ND	<0.069		30	
Dibromochloromethane	ug/L	ND	<0.048		30	
Dibromomethane	ug/L	ND	<0.14		30	
Dichlorodifluoromethane	ug/L	ND	<0.075		30	
Dichlorofluoromethane	ug/L	ND	<0.054		30	
Diisopropyl ether	ug/L	ND	<0.050		30	
Ethyl-tert-butyl ether	ug/L	ND	<0.062		30	
Ethylbenzene	ug/L	ND	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	ND	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	ND	<0.064		30	
m&p-Xylene	ug/L	ND	<0.11		30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

SAMPLE DUPLICATE: 2636031

Parameter	Units	10394504015 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	ND	<0.047		30	
Methylene Chloride	ug/L	ND	<0.097		30	
n-Butylbenzene	ug/L	ND	<0.16		30	
n-Propylbenzene	ug/L	ND	<0.049		30	
Naphthalene	ug/L	ND	<0.064		30	
o-Xylene	ug/L	ND	<0.044		30	
p-Isopropyltoluene	ug/L	ND	<0.064		30	
sec-Butylbenzene	ug/L	ND	<0.094		30	
Styrene	ug/L	ND	<0.056		30	
tert-Amylmethyl ether	ug/L	ND	<0.073		30	
tert-Butyl Alcohol	ug/L	ND	<0.89		30	
tert-Butylbenzene	ug/L	ND	<0.051		30	
Tetrachloroethene	ug/L	ND	<0.13		30	
Tetrahydrofuran	ug/L	ND	<1.5		30	
Toluene	ug/L	ND	<0.059		30	
trans-1,2-Dichloroethene	ug/L	ND	<0.15		30	
trans-1,3-Dichloropropene	ug/L	ND	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	<0.45		30	
Trichloroethene	ug/L	ND	<0.044		30	
Trichlorofluoromethane	ug/L	ND	<0.055		30	
Vinyl acetate	ug/L	ND	<0.12		30	
Vinyl chloride	ug/L	ND	<0.098		30	
Xylene (Total)	ug/L	ND	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	109	107	2		
4-Bromofluorobenzene (S)	%	102	101	0		
Toluene-d8 (S)	%	99	100	0		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 483781

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10394792

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10394792

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10394792001	MW21D-GW-20-070517	EPA 8260B	483781		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10394792

### Section A

### Section B

### Section C

#### Required Client Information:

#### Required Project Information:

#### Invoice Information:

Page: 1 of 1

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Theriault
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Requested Due Date: <del>10 Day Standard</del> 3 day	Project Name: UPRR Freeman	Pace Project Manager: Jennifer Gross
	Project #: 1497	Pace Profile #: 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -, ) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMPL)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test Y/N	Requested Analysis Filtered (Y/N)	Comments					
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Low Level VOCs by 8260				6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5510
1	MW21D-GW-20-070517			WTG		7-5-17	11:15			3							X								001	
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	APD / CH2M	7-6-17	12:00	APD / PACE	7/7/17	11:23	Y Y Y Y
*Field filtered by client						845	

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	Steve Demus
SIGNATURE of SAMPLER:	<i>APD</i>
DATE Signed:	7-6-17

TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
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**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M Hill Project #: WO#: 10394792

**WO#: 10394792**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7222 2734 9076

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB

Thermometer Used:  151401163  151401164

Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 5.0 Cooler Temp Corrected (°C): 5.0 Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: True Date and Initials of Person Examining Contents: JX 7/17/17

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>JMG 7/7/17</u>	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <u>TB</u>
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>N/A</u>		<u>JMG 7/7/17</u>

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>10:58</u>	Temp: _____	Corrected Temp: <u>5.0</u>
Time: <u>11:05</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: 07/07/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



July 13, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

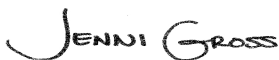
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395114

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on July 11, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10395114001	MW15D-GW-070717	Water	07/07/17 09:20	07/11/17 10:00
10395114002	MW20D-GW-070717	Water	07/07/17 12:00	07/11/17 10:00
10395114003	TB-070717	Water	07/07/17 07:00	07/11/17 10:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10395114001	MW15D-GW-070717	EPA 8260B	DJB	83	PASI-M
10395114002	MW20D-GW-070717	EPA 8260B	DJB	83	PASI-M
10395114003	TB-070717	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10395114001</b>	<b>MW15D-GW-070717</b>					
EPA 8260B	Acetone	5.7J	ug/L	20.0	07/13/17 03:18	
EPA 8260B	Carbon tetrachloride	8.9	ug/L	0.50	07/13/17 03:18	
EPA 8260B	Chloroform	0.48J	ug/L	1.0	07/13/17 03:18	
<b>10395114002</b>	<b>MW20D-GW-070717</b>					
EPA 8260B	Acetone	4.6J	ug/L	20.0	07/13/17 03:39	
EPA 8260B	Carbon disulfide	0.29J	ug/L	1.0	07/13/17 03:39	
EPA 8260B	Carbon tetrachloride	32.1	ug/L	0.50	07/13/17 03:39	
EPA 8260B	Chloroform	1.3	ug/L	1.0	07/13/17 03:39	
<b>10395114003</b>	<b>TB-070717</b>					
EPA 8260B	Acetone	5.8J	ug/L	20.0	07/13/17 00:24	
EPA 8260B	Methylene Chloride	0.33J	ug/L	4.0	07/13/17 00:24	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 13, 2017

### General Information:

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 484519

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2638281)
  - Tetrahydrofuran
- MS (Lab ID: 2638282)
  - Tetrahydrofuran
- MSD (Lab ID: 2638283)
  - Tetrahydrofuran

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 484519

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2638281)
  - Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 13, 2017

QC Batch: 484519

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10394491009

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2638282)
  - Tetrahydrofuran
- MSD (Lab ID: 2638283)
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Sample: MW15D-GW-070717 Lab ID: 10395114001 Collected: 07/07/17 09:20 Received: 07/11/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 03:18	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/13/17 03:18	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 03:18	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 03:18	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/13/17 03:18	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 03:18	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/13/17 03:18	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/13/17 03:18	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/13/17 03:18	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/13/17 03:18	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/13/17 03:18	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/13/17 03:18	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/13/17 03:18	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/13/17 03:18	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/13/17 03:18	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/13/17 03:18	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/13/17 03:18	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/13/17 03:18	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/13/17 03:18	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/13/17 03:18	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/13/17 03:18	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/13/17 03:18	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/13/17 03:18	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/13/17 03:18	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/13/17 03:18	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/13/17 03:18	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/13/17 03:18	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/13/17 03:18	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/13/17 03:18	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/13/17 03:18	108-10-1	
Acetone	5.7J	ug/L	20.0	0.64	1		07/13/17 03:18	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/13/17 03:18	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/13/17 03:18	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/13/17 03:18	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/13/17 03:18	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/13/17 03:18	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/13/17 03:18	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/13/17 03:18	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/13/17 03:18	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		07/13/17 03:18	75-15-0	
Carbon tetrachloride	8.9	ug/L	0.50	0.079	1		07/13/17 03:18	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/13/17 03:18	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/13/17 03:18	75-00-3	
Chloroform	0.48J	ug/L	1.0	0.21	1		07/13/17 03:18	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/13/17 03:18	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/13/17 03:18	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

**Sample: MW15D-GW-070717**      **Lab ID: 10395114001**      Collected: 07/07/17 09:20      Received: 07/11/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/13/17 03:18	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/13/17 03:18	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/13/17 03:18	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/13/17 03:18	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/13/17 03:18	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/13/17 03:18	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/13/17 03:18	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/13/17 03:18	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/13/17 03:18	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		07/13/17 03:18	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/13/17 03:18	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/13/17 03:18	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/13/17 03:18	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/13/17 03:18	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/13/17 03:18	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/13/17 03:18	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/13/17 03:18	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/13/17 03:18	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/13/17 03:18	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/13/17 03:18	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/13/17 03:18	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/13/17 03:18	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/13/17 03:18	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/13/17 03:18	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/13/17 03:18	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/13/17 03:18	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/13/17 03:18	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/13/17 03:18	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/13/17 03:18	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/13/17 03:18	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/13/17 03:18	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/13/17 03:18	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/13/17 03:18	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/13/17 03:18	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		07/13/17 03:18	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		07/13/17 03:18	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		07/13/17 03:18	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Sample: MW20D-GW-070717 Lab ID: 10395114002 Collected: 07/07/17 12:00 Received: 07/11/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 03:39	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/13/17 03:39	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 03:39	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 03:39	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/13/17 03:39	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 03:39	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/13/17 03:39	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/13/17 03:39	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/13/17 03:39	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/13/17 03:39	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/13/17 03:39	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/13/17 03:39	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/13/17 03:39	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/13/17 03:39	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/13/17 03:39	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/13/17 03:39	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/13/17 03:39	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/13/17 03:39	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/13/17 03:39	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/13/17 03:39	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/13/17 03:39	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/13/17 03:39	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/13/17 03:39	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/13/17 03:39	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/13/17 03:39	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/13/17 03:39	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/13/17 03:39	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/13/17 03:39	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/13/17 03:39	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/13/17 03:39	108-10-1	
Acetone	4.6J	ug/L	20.0	0.64	1		07/13/17 03:39	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/13/17 03:39	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/13/17 03:39	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/13/17 03:39	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/13/17 03:39	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/13/17 03:39	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/13/17 03:39	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/13/17 03:39	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/13/17 03:39	74-83-9	
Carbon disulfide	0.29J	ug/L	1.0	0.20	1		07/13/17 03:39	75-15-0	
Carbon tetrachloride	32.1	ug/L	0.50	0.079	1		07/13/17 03:39	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/13/17 03:39	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/13/17 03:39	75-00-3	
Chloroform	1.3	ug/L	1.0	0.21	1		07/13/17 03:39	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/13/17 03:39	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/13/17 03:39	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

**Sample: MW20D-GW-070717**      **Lab ID: 10395114002**      Collected: 07/07/17 12:00      Received: 07/11/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/13/17 03:39	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/13/17 03:39	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/13/17 03:39	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/13/17 03:39	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/13/17 03:39	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/13/17 03:39	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/13/17 03:39	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/13/17 03:39	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/13/17 03:39	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		07/13/17 03:39	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/13/17 03:39	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/13/17 03:39	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/13/17 03:39	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/13/17 03:39	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/13/17 03:39	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/13/17 03:39	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/13/17 03:39	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/13/17 03:39	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/13/17 03:39	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/13/17 03:39	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/13/17 03:39	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/13/17 03:39	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/13/17 03:39	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/13/17 03:39	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/13/17 03:39	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/13/17 03:39	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/13/17 03:39	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/13/17 03:39	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/13/17 03:39	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/13/17 03:39	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/13/17 03:39	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/13/17 03:39	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/13/17 03:39	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/13/17 03:39	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		07/13/17 03:39	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		07/13/17 03:39	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		07/13/17 03:39	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Sample: **TB-070717** Lab ID: **10395114003** Collected: 07/07/17 07:00 Received: 07/11/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 00:24	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/13/17 00:24	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 00:24	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 00:24	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/13/17 00:24	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 00:24	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/13/17 00:24	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/13/17 00:24	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/13/17 00:24	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/13/17 00:24	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/13/17 00:24	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/13/17 00:24	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/13/17 00:24	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/13/17 00:24	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/13/17 00:24	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/13/17 00:24	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/13/17 00:24	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/13/17 00:24	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/13/17 00:24	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/13/17 00:24	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/13/17 00:24	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/13/17 00:24	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/13/17 00:24	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/13/17 00:24	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/13/17 00:24	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/13/17 00:24	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/13/17 00:24	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/13/17 00:24	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/13/17 00:24	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/13/17 00:24	108-10-1	
Acetone	5.8J	ug/L	20.0	0.64	1		07/13/17 00:24	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/13/17 00:24	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/13/17 00:24	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/13/17 00:24	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/13/17 00:24	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/13/17 00:24	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/13/17 00:24	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/13/17 00:24	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/13/17 00:24	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		07/13/17 00:24	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		07/13/17 00:24	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/13/17 00:24	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/13/17 00:24	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		07/13/17 00:24	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/13/17 00:24	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/13/17 00:24	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

**Sample: TB-070717**      **Lab ID: 10395114003**      Collected: 07/07/17 07:00      Received: 07/11/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/13/17 00:24	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/13/17 00:24	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/13/17 00:24	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/13/17 00:24	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/13/17 00:24	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/13/17 00:24	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/13/17 00:24	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/13/17 00:24	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/13/17 00:24	1634-04-4	
Methylene Chloride	0.33J	ug/L	4.0	0.097	1		07/13/17 00:24	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/13/17 00:24	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/13/17 00:24	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/13/17 00:24	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/13/17 00:24	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/13/17 00:24	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/13/17 00:24	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/13/17 00:24	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/13/17 00:24	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/13/17 00:24	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/13/17 00:24	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/13/17 00:24	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/13/17 00:24	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/13/17 00:24	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/13/17 00:24	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/13/17 00:24	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/13/17 00:24	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/13/17 00:24	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/13/17 00:24	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/13/17 00:24	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/13/17 00:24	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/13/17 00:24	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/13/17 00:24	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/13/17 00:24	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/13/17 00:24	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		07/13/17 00:24	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		07/13/17 00:24	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		07/13/17 00:24	460-00-4	

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

QC Batch: 484519 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10395114001, 10395114002, 10395114003

METHOD BLANK: 2638280 Matrix: Water

Associated Lab Samples: 10395114001, 10395114002, 10395114003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	07/12/17 23:40	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	07/12/17 23:40	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	07/12/17 23:40	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	07/12/17 23:40	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	07/12/17 23:40	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	07/12/17 23:40	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	07/12/17 23:40	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	07/12/17 23:40	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	07/12/17 23:40	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	07/12/17 23:40	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	07/12/17 23:40	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	1.0	0.068	07/12/17 23:40	MN
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	07/12/17 23:40	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	07/12/17 23:40	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	07/12/17 23:40	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	07/12/17 23:40	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	07/12/17 23:40	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	07/12/17 23:40	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	07/12/17 23:40	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	07/12/17 23:40	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	07/12/17 23:40	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	07/12/17 23:40	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	07/12/17 23:40	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	07/12/17 23:40	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	07/12/17 23:40	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	07/12/17 23:40	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	07/12/17 23:40	
2-Hexanone	ug/L	<0.19	5.0	0.19	07/12/17 23:40	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	07/12/17 23:40	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	07/12/17 23:40	
Acetone	ug/L	<0.64	20.0	0.64	07/12/17 23:40	
Acrolein	ug/L	<2.1	10.0	2.1	07/12/17 23:40	
Acrylonitrile	ug/L	<0.49	10.0	0.49	07/12/17 23:40	
Benzene	ug/L	<0.042	0.50	0.042	07/12/17 23:40	
Bromobenzene	ug/L	<0.087	0.50	0.087	07/12/17 23:40	
Bromochloromethane	ug/L	<0.082	1.0	0.082	07/12/17 23:40	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	07/12/17 23:40	
Bromoform	ug/L	<0.11	4.0	0.11	07/12/17 23:40	
Bromomethane	ug/L	<0.20	4.0	0.20	07/12/17 23:40	
Carbon disulfide	ug/L	<0.20	1.0	0.20	07/12/17 23:40	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	07/12/17 23:40	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395114

METHOD BLANK: 2638280 Matrix: Water  
Associated Lab Samples: 10395114001, 10395114002, 10395114003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	07/12/17 23:40	
Chloroethane	ug/L	<0.12	1.0	0.12	07/12/17 23:40	
Chloroform	ug/L	<0.21	1.0	0.21	07/12/17 23:40	
Chloromethane	ug/L	<0.080	4.0	0.080	07/12/17 23:40	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	07/12/17 23:40	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	07/12/17 23:40	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	07/12/17 23:40	
Dibromomethane	ug/L	<0.14	1.0	0.14	07/12/17 23:40	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	07/12/17 23:40	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	07/12/17 23:40	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	07/12/17 23:40	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	07/12/17 23:40	
Ethylbenzene	ug/L	<0.075	0.50	0.075	07/12/17 23:40	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	07/12/17 23:40	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	07/12/17 23:40	
m&p-Xylene	ug/L	<0.11	1.0	0.11	07/12/17 23:40	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	07/12/17 23:40	
Methylene Chloride	ug/L	<0.097	4.0	0.097	07/12/17 23:40	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	07/12/17 23:40	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	07/12/17 23:40	
Naphthalene	ug/L	<0.064	4.0	0.064	07/12/17 23:40	MN
o-Xylene	ug/L	<0.044	0.50	0.044	07/12/17 23:40	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	07/12/17 23:40	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	07/12/17 23:40	
Styrene	ug/L	<0.056	0.50	0.056	07/12/17 23:40	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	07/12/17 23:40	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	07/12/17 23:40	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	07/12/17 23:40	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	07/12/17 23:40	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	07/12/17 23:40	
Toluene	ug/L	<0.059	0.50	0.059	07/12/17 23:40	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	07/12/17 23:40	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	07/12/17 23:40	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	07/12/17 23:40	
Trichloroethene	ug/L	<0.044	0.40	0.044	07/12/17 23:40	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	07/12/17 23:40	
Vinyl acetate	ug/L	<0.12	10.0	0.12	07/12/17 23:40	
Vinyl chloride	ug/L	<0.098	0.20	0.098	07/12/17 23:40	
Xylene (Total)	ug/L	<0.15	1.5	0.15	07/12/17 23:40	
1,2-Dichloroethane-d4 (S)	%	100	75-137		07/12/17 23:40	
4-Bromofluorobenzene (S)	%	104	75-125		07/12/17 23:40	
Toluene-d8 (S)	%	98	75-125		07/12/17 23:40	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

LABORATORY CONTROL SAMPLE: 2638281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.9	105	75-136	
1,1,1-Trichloroethane	ug/L	20	20.2	101	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	21.6	108	71-138	
1,1,2-Trichloroethane	ug/L	20	21.8	109	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.0	95	69-126	
1,1-Dichloroethane	ug/L	20	20.0	100	75-125	
1,1-Dichloroethene	ug/L	20	19.9	99	75-125	
1,1-Dichloropropene	ug/L	20	20.0	100	75-125	
1,2,3-Trichlorobenzene	ug/L	20	19.0	95	75-125	
1,2,3-Trichloropropane	ug/L	20	21.1	105	75-125	
1,2,4-Trichlorobenzene	ug/L	20	18.5	92	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.3	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	50.9	102	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.4	107	75-125	
1,2-Dichlorobenzene	ug/L	20	20.7	103	75-125	
1,2-Dichloroethane	ug/L	20	20.4	102	70-125	
1,2-Dichloroethene (Total)	ug/L	40	39.9	100	75-125	
1,2-Dichloropropane	ug/L	20	20.7	104	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.8	104	75-125	
1,3-Dichlorobenzene	ug/L	20	20.0	100	75-125	
1,3-Dichloropropane	ug/L	20	21.9	109	75-125	
1,4-Dichlorobenzene	ug/L	20	19.6	98	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	383	96	64-140	
2,2,4-Trimethylpentane	ug/L	20	17.6	88	68-125	
2,2-Dichloropropane	ug/L	20	17.2	86	70-131	
2-Butanone (MEK)	ug/L	100	97.7	98	69-125	
2-Chlorotoluene	ug/L	20	19.6	98	75-125	
2-Hexanone	ug/L	100	109	109	73-129	
4-Chlorotoluene	ug/L	20	20.9	105	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	111	111	73-125	
Acetone	ug/L	100	117	117	66-126	
Acrolein	ug/L	200	218	109	56-150	
Acrylonitrile	ug/L	200	206	103	68-129	
Benzene	ug/L	20	19.8	99	75-125	
Bromobenzene	ug/L	20	20.3	101	75-125	
Bromochloromethane	ug/L	20	21.3	106	75-126	
Bromodichloromethane	ug/L	20	20.9	105	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	12.6	63	34-143	
Carbon disulfide	ug/L	20	18.0	90	71-125	
Carbon tetrachloride	ug/L	20	19.8	99	71-145	
Chlorobenzene	ug/L	20	19.5	98	75-125	
Chloroethane	ug/L	20	20.1	101	75-125	
Chloroform	ug/L	20	19.1	96	75-125	
Chloromethane	ug/L	20	18.2	91	54-125	
cis-1,2-Dichloroethene	ug/L	20	20.7	103	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.8	104	75-125	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

LABORATORY CONTROL SAMPLE: 2638281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.7	109	74-141	
Dibromomethane	ug/L	20	20.7	104	75-125	
Dichlorodifluoromethane	ug/L	20	19.3	97	59-130	
Dichlorofluoromethane	ug/L	20	20.0	100	75-125	
Diisopropyl ether	ug/L	20	20.4	102	69-125	
Ethyl-tert-butyl ether	ug/L	20	21.9	109	73-125	
Ethylbenzene	ug/L	20	19.5	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	18.3	91	75-131	
Isopropylbenzene (Cumene)	ug/L	20	21.3	107	75-125	
m&p-Xylene	ug/L	40	42.3	106	75-125	
Methyl-tert-butyl ether	ug/L	20	21.1	106	75-125	
Methylene Chloride	ug/L	20	20.3	102	73-125	
n-Butylbenzene	ug/L	20	19.4	97	75-125	
n-Propylbenzene	ug/L	20	19.4	97	75-125	
Naphthalene	ug/L	20	19.1	96	74-125	
o-Xylene	ug/L	20	21.6	108	75-125	
p-Isopropyltoluene	ug/L	20	20.0	100	75-125	
sec-Butylbenzene	ug/L	20	19.9	99	75-125	
Styrene	ug/L	20	22.1	111	75-125	
tert-Amylmethyl ether	ug/L	20	21.7	108	71-126	
tert-Butyl Alcohol	ug/L	200	190	95	69-131	
tert-Butylbenzene	ug/L	20	19.9	99	75-125	
Tetrachloroethene	ug/L	20	19.6	98	75-125	
Tetrahydrofuran	ug/L	200	293	146	65-127	CH,L3
Toluene	ug/L	20	19.8	99	75-125	
trans-1,2-Dichloroethene	ug/L	20	19.3	96	75-125	
trans-1,3-Dichloropropene	ug/L	20	20.5	103	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	42.1	84	30-150	
Trichloroethene	ug/L	20	20.7	103	75-125	
Trichlorofluoromethane	ug/L	20	20.0	100	71-140	
Vinyl acetate	ug/L	20	20.1	101	68-137	
Vinyl chloride	ug/L	20	18.8	94	70-125	
Xylene (Total)	ug/L	60	63.9	106	75-125	
1,2-Dichloroethane-d4 (S)	%			99	75-137	
4-Bromofluorobenzene (S)	%			100	75-125	
Toluene-d8 (S)	%			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2638282 2638283

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10394491009 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	19.6	19.1	98	96	75-137	2	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	20.3	19.7	101	99	75-139	3	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	19.6	18.9	98	95	60-142	3	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	19.6	19.0	98	95	75-128	3	30	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Parameter	Units	2638282		2638283		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10394491009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	21.6	21.1	108	106	62-150	2	30		
1,1-Dichloroethane	ug/L	ND	20	20	19.3	19.1	97	96	70-129	1	30		
1,1-Dichloroethene	ug/L	ND	20	20	20.6	20.2	103	101	67-141	2	30		
1,1-Dichloropropene	ug/L	ND	20	20	20.4	19.9	102	99	64-144	3	30		
1,2,3-Trichlorobenzene	ug/L	ND	20	20	19.4	19.0	97	95	66-139	2	30		
1,2,3-Trichloropropane	ug/L	ND	20	20	19.1	18.9	96	95	69-134	1	30		
1,2,4-Trichlorobenzene	ug/L	ND	20	20	18.5	18.1	92	90	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	ND	20	20	18.7	18.1	94	90	65-143	3	30		
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	45.5	44.7	91	89	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	19.0	18.7	95	93	74-129	2	30		
1,2-Dichlorobenzene	ug/L	ND	20	20	19.7	18.9	99	94	68-135	4	30		
1,2-Dichloroethane	ug/L	ND	20	20	18.4	18.2	92	91	73-125	1	30		
1,2-Dichloroethene (Total)	ug/L	ND	40	40	39.5	38.7	99	97	69-134	2	30		
1,2-Dichloropropane	ug/L	ND	20	20	19.6	18.5	98	93	64-130	5	30		
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.3	19.6	101	98	64-146	3	30		
1,3-Dichlorobenzene	ug/L	ND	20	20	19.3	18.4	97	92	69-135	5	30		
1,3-Dichloropropane	ug/L	ND	20	20	19.5	19.1	97	96	67-128	2	30		
1,4-Dichlorobenzene	ug/L	ND	20	20	18.3	18.1	92	91	66-134	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	352	345	88	86	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	ND	20	20	20.4	20.5	102	102	48-150	0	30		
2,2-Dichloropropane	ug/L	ND	20	20	16.6	16.1	83	80	50-150	3	30		
2-Butanone (MEK)	ug/L	ND	100	100	84.6	81.5	85	81	58-125	4	30		
2-Chlorotoluene	ug/L	ND	20	20	19.4	18.7	97	93	65-138	4	30		
2-Hexanone	ug/L	ND	100	100	95.7	93.9	96	94	61-134	2	30		
4-Chlorotoluene	ug/L	ND	20	20	20.4	19.3	102	97	68-135	5	30		
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	96.3	94.3	96	94	61-130	2	30		
Acetone	ug/L	32.2	100	100	164	143	132	111	51-140	13	30		
Acrolein	ug/L	ND	200	200	227	221	113	110	48-150	3	30		
Acrylonitrile	ug/L	ND	200	200	185	179	92	89	55-134	3	30		
Benzene	ug/L	ND	20	20	19.1	18.7	96	94	63-132	2	30		
Bromobenzene	ug/L	ND	20	20	19.0	18.0	95	90	67-138	6	30		
Bromochloromethane	ug/L	ND	20	20	19.7	18.6	98	93	66-138	6	30		
Bromodichloromethane	ug/L	ND	20	20	19.8	19.6	99	98	75-137	1	30		
Bromoform	ug/L	ND	20	20	18.2	18.1	91	90	65-129	0	30		
Bromomethane	ug/L	ND	20	20	15.6	17.1	78	86	41-150	9	30		
Carbon disulfide	ug/L	ND	20	20	18.9	18.2	94	91	72-132	3	30		
Carbon tetrachloride	ug/L	ND	20	20	20.6	20.6	103	103	75-150	0	30		
Chlorobenzene	ug/L	ND	20	20	18.8	18.2	94	91	73-127	3	30		
Chloroethane	ug/L	ND	20	20	20.0	21.2	100	106	74-138	6	30		
Chloroform	ug/L	ND	20	20	18.6	18.0	93	90	74-125	3	30		
Chloromethane	ug/L	ND	20	20	18.8	18.9	94	94	58-129	1	30		
cis-1,2-Dichloroethene	ug/L	ND	20	20	19.9	19.6	100	98	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	ND	20	20	19.2	18.0	96	90	66-129	7	30		
Dibromochloromethane	ug/L	ND	20	20	19.9	19.2	99	96	75-133	4	30		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Parameter	Units	10394491009		2638282		2638283		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	ND	20	20	18.8	17.9	94	90	68-134	5	30		
Dichlorodifluoromethane	ug/L	ND	20	20	21.6	22.7	108	114	72-150	5	30		
Dichlorofluoromethane	ug/L	ND	20	20	19.7	20.3	99	102	75-129	3	30		
Diisopropyl ether	ug/L	ND	20	20	18.9	18.4	95	92	62-128	3	30		
Ethyl-tert-butyl ether	ug/L	ND	20	20	19.8	19.5	99	97	63-132	2	30		
Ethylbenzene	ug/L	ND	20	20	19.1	18.3	95	92	72-130	4	30		
Hexachloro-1,3-butadiene	ug/L	ND	20	20	18.6	18.0	93	90	71-150	3	30		
Isopropylbenzene (Cumene)	ug/L	ND	20	20	21.4	20.8	107	104	70-136	3	30		
m&p-Xylene	ug/L	ND	40	40	41.6	40.4	104	101	64-142	3	30		
Methyl-tert-butyl ether	ug/L	ND	20	20	19.2	18.8	96	94	72-125	2	30		
Methylene Chloride	ug/L	ND	20	20	19.0	18.6	95	93	60-132	2	30		
n-Butylbenzene	ug/L	ND	20	20	20.3	19.4	102	97	60-150	4	30		
n-Propylbenzene	ug/L	ND	20	20	19.6	19.5	98	98	63-142	0	30		
Naphthalene	ug/L	ND	20	20	18.7	18.5	94	92	67-125	1	30		
o-Xylene	ug/L	ND	20	20	20.6	20.7	103	104	60-143	1	30		
p-Isopropyltoluene	ug/L	ND	20	20	20.5	19.7	103	99	64-146	4	30		
sec-Butylbenzene	ug/L	ND	20	20	21.1	20.1	105	101	67-144	4	30		
Styrene	ug/L	ND	20	20	20.7	19.8	104	99	67-136	5	30		
tert-Amylmethyl ether	ug/L	ND	20	20	19.3	18.9	97	94	60-134	2	30		
tert-Butyl Alcohol	ug/L	ND	200	200	189	187	95	93	56-146	1	30		
tert-Butylbenzene	ug/L	ND	20	20	20.5	19.7	103	98	68-135	4	30		
Tetrachloroethene	ug/L	ND	20	20	19.6	18.8	98	94	67-148	4	30		
Tetrahydrofuran	ug/L	ND	200	200	332	323	166	161	51-141	3	30	CH,M0	
Toluene	ug/L	ND	20	20	18.8	18.6	94	93	61-140	1	30		
trans-1,2-Dichloroethene	ug/L	ND	20	20	19.5	19.1	98	96	62-138	2	30		
trans-1,3-Dichloropropene	ug/L	ND	20	20	19.1	17.9	95	90	67-134	6	30		
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	38.5	37.7	77	75	30-150	2	30		
Trichloroethene	ug/L	ND	20	20	20.4	20.0	102	100	64-149	2	30		
Trichlorofluoromethane	ug/L	ND	20	20	21.7	22.2	108	111	75-150	3	30		
Vinyl acetate	ug/L	ND	20	20	18.4	16.9	92	84	49-143	9	30		
Vinyl chloride	ug/L	ND	20	20	19.8	20.5	99	102	75-133	3	30		
Xylene (Total)	ug/L	ND	60	60	62.2	61.1	104	102	63-142	2	30		
1,2-Dichloroethane-d4 (S)	%						98	100	75-137				
4-Bromofluorobenzene (S)	%						100	101	75-125				
Toluene-d8 (S)	%						98	99	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395114

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395114

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10395114001	MW15D-GW-070717	EPA 8260B	484519		
10395114002	MW20D-GW-070717	EPA 8260B	484519		
10395114003	TB-070717	EPA 8260B	484519		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10395114

**Section A**

**Required Client Information:**

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email: mark.Ochsner@ch2n.com  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date/Circle: 24 Hour 1.5 Day / 10 Day

**Section B**

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus  
 Purchase Order #: \_\_\_\_\_  
 Project Name: UPRR\_Freeman  
 Project #: 1497

**Section C**

**Invoice Information:**

Attention: Gary Honeyman  
 Company Name: UPRR  
 Address: \_\_\_\_\_  
 Pace Quote: \_\_\_\_\_ Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447

Page: 1 of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	CODE	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analyses Test	VOCs by 8260 Low level	Dry Weight	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other					
				DATE	TIME	DATE	TIME															
1	MW150-GW-070717	WTG		7/7/17	0920		3				X											001
2	MW200-GW-070717	WTG		7/7/17	1200		3				X											002
3	TB-070717	WTG		7/7/17	0700		2				X											Trip Blank 003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Low Level Voc's.	ZKB / CH2M	7/10/17	1420	[Signature] - PACE	7/11/17	1000	1.4	Y	Y	Y


SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	[Signature]				
SIGNATURE of SAMPLER:	[Signature]	DATE Signed:	7/10/17		

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: **CH2M HILL**

Project #:

**WO#: 10395114**



10395114

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other:  
 Tracking Number: **7367 5326 0471**

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No  
 Thermometer Used:  151401163  151401164      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): **1.4**      Cooler Temp Corrected (°C): **1.4**      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: **TRUE**      Date and Initials of Person Examining Contents: **ME 7-11-17**

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed:      Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <b>2/2 Trip Blanks</b>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>060517-3CYR</b>	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1038</b>	Temp: <b>1.4</b>	Corrected Temp: <b>1.4</b>
Time: _____	put in cooler	
Time: <b>1045</b>	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: **07/11/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



July 24, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

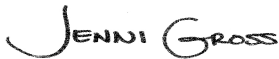
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on July 11, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

California Certification #2973

Montana Certificate #CERT0103

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10395116001	MW15D-GW-070717	Water	07/07/17 09:20	07/11/17 10:00
10395116002	MW20D-GW-070717	Water	07/07/17 12:00	07/11/17 10:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10395116001	MW15D-GW-070717	RSK 175	MJL	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10395116002	MW20D-GW-070717	RSK 175	MJL	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10395116001</b>	<b>MW15D-GW-070717</b>					
RSK 175	Methane	1.9J	ug/L	10.0	07/13/17 13:44	
6010C Met	Barium, Dissolved	11.0	ug/L	10.0	07/19/17 04:04	
6010C Met	Calcium, Dissolved	38700	ug/L	500	07/19/17 04:04	
6010C Met	Magnesium, Dissolved	14800	ug/L	500	07/19/17 04:04	
6010C Met	Manganese, Dissolved	3.4J	ug/L	5.0	07/19/17 04:04	
6010C Met	Potassium, Dissolved	2780	ug/L	2500	07/19/17 04:04	
6010C Met	Sodium, Dissolved	16000	ug/L	1000	07/19/17 04:04	
6010C Met	Vanadium, Dissolved	10.2J	ug/L	15.0	07/19/17 04:04	
SM 2320B	Alkalinity, Total as CaCO3	174	mg/L	5.0	07/13/17 11:27	
SM 2540C	Total Dissolved Solids	235	mg/L	10.0	07/13/17 15:35	
EPA 300.0	Chloride	3.0	mg/L	1.2	07/11/17 20:07	
EPA 300.0	Nitrate as N	1.8	mg/L	0.10	07/11/17 20:07	H3
EPA 300.0	Sulfate	7.1	mg/L	1.2	07/14/17 14:03	
EPA 353.2	Nitrogen, NO2 plus NO3	1.9	mg/L	0.020	07/12/17 12:15	M1
SM 5310C	Total Organic Carbon	0.66J	mg/L	1.0	07/14/17 19:56	
<b>10395116002</b>	<b>MW20D-GW-070717</b>					
RSK 175	Methane	1.6J	ug/L	10.0	07/13/17 13:59	
6010C Met	Barium, Dissolved	25.2	ug/L	10.0	07/19/17 04:18	
6010C Met	Calcium, Dissolved	60600	ug/L	500	07/19/17 04:18	
6010C Met	Chromium, Dissolved	0.87J	ug/L	10.0	07/19/17 04:18	
6010C Met	Copper, Dissolved	0.91J	ug/L	10.0	07/19/17 04:18	
6010C Met	Magnesium, Dissolved	21600	ug/L	500	07/19/17 04:18	
6010C Met	Manganese, Dissolved	33.0	ug/L	5.0	07/19/17 04:18	
6010C Met	Potassium, Dissolved	3490	ug/L	2500	07/19/17 04:18	
6010C Met	Sodium, Dissolved	24900	ug/L	1000	07/19/17 04:18	
6010C Met	Vanadium, Dissolved	6.5J	ug/L	15.0	07/19/17 04:18	
EPA 7470A	Mercury, Dissolved	0.070J	ug/L	0.20	07/19/17 13:47	
SM 2320B	Alkalinity, Total as CaCO3	266	mg/L	5.0	07/13/17 12:20	
SM 2540C	Total Dissolved Solids	331	mg/L	10.0	07/13/17 15:35	
EPA 300.0	Chloride	7.1	mg/L	1.2	07/11/17 20:22	
EPA 300.0	Nitrate as N	1.1	mg/L	0.10	07/11/17 20:22	H3
EPA 300.0	Sulfate	10.3	mg/L	1.2	07/14/17 14:18	
EPA 353.2	Nitrogen, NO2 plus NO3	1.2	mg/L	0.020	07/12/17 12:18	
SM 5310C	Total Organic Carbon	1.6	mg/L	1.0	07/14/17 20:39	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

### General Information:

2 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484840

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10395145005,10395360003

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2639693)
  - Alkalinity, Total as CaCO<sub>3</sub>

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

### General Information:

2 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 84562

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2057480001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 360266)
- Sulfide, Total

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

### General Information:

2 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.

- MW15D-GW-070717 (Lab ID: 10395116001)
- MW20D-GW-070717 (Lab ID: 10395116002)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484226

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10394827001,10394881004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2636982)
  - Chloride
  - Nitrate as N
- MS (Lab ID: 2636984)
  - Chloride
- MSD (Lab ID: 2636983)
  - Chloride
  - Nitrate as N
- MSD (Lab ID: 2636985)
  - Chloride
  - Sulfate

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2636982)
  - Sulfate
- MSD (Lab ID: 2636983)
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

---

**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484583

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10394869001,10395116001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2638458)
  - Nitrogen, NO2 plus NO3

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 2638456)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

Analyte Comments:

QC Batch: 484583

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2638457)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2638458)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** July 24, 2017

**General Information:**

2 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

**Sample: MW15D-GW-070717**      **Lab ID: 10395116001**      Collected: 07/07/17 09:20      Received: 07/11/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		07/13/17 13:44	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		07/13/17 13:44	74-85-1	
Methane	1.9J	ug/L	10.0	1.1	1		07/13/17 13:44	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/17/17 12:01	07/19/17 04:04	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/17/17 12:01	07/19/17 04:04	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/17/17 12:01	07/19/17 04:04	7440-38-2	
Barium, Dissolved	11.0	ug/L	10.0	0.22	1	07/17/17 12:01	07/19/17 04:04	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/17/17 12:01	07/19/17 04:04	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/17/17 12:01	07/19/17 04:04	7440-43-9	
Calcium, Dissolved	38700	ug/L	500	24.7	1	07/17/17 12:01	07/19/17 04:04	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/17/17 12:01	07/19/17 04:04	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/17/17 12:01	07/19/17 04:04	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	07/17/17 12:01	07/19/17 04:04	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/17/17 12:01	07/19/17 04:04	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/17/17 12:01	07/19/17 04:04	7439-92-1	
Magnesium, Dissolved	14800	ug/L	500	2.6	1	07/17/17 12:01	07/19/17 04:04	7439-95-4	
Manganese, Dissolved	3.4J	ug/L	5.0	0.38	1	07/17/17 12:01	07/19/17 04:04	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/17/17 12:01	07/19/17 04:04	7440-02-0	
Potassium, Dissolved	2780	ug/L	2500	126	1	07/17/17 12:01	07/19/17 04:04	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/17/17 12:01	07/19/17 04:04	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/17/17 12:01	07/19/17 04:04	7440-22-4	
Sodium, Dissolved	16000	ug/L	1000	44.6	1	07/17/17 12:01	07/19/17 04:04	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	07/17/17 12:01	07/19/17 04:04	7440-28-0	
Vanadium, Dissolved	10.2J	ug/L	15.0	0.42	1	07/17/17 12:01	07/19/17 04:04	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	07/17/17 12:01	07/19/17 04:04	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/17/17 09:23	07/19/17 13:45	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	174	mg/L	5.0	1.4	1		07/13/17 11:27		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	235	mg/L	10.0	5.0	1		07/13/17 15:35		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		07/13/17 15:17	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.0	mg/L	1.2	0.10	1		07/11/17 20:07	16887-00-6	
Nitrate as N	1.8	mg/L	0.10	0.013	1		07/11/17 20:07	14797-55-8	H3
Sulfate	7.1	mg/L	1.2	0.16	1		07/14/17 14:03	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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**Sample: MW15D-GW-070717**      **Lab ID: 10395116001**      Collected: 07/07/17 09:20      Received: 07/11/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.9</b>	mg/L	0.020	0.0075	1		07/12/17 12:15		M1
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/24/17 09:28	07/24/17 16:07		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.66J</b>	mg/L	1.0	0.20	1		07/14/17 19:56	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

**Sample:** MW20D-GW-070717    **Lab ID:** 10395116002    Collected: 07/07/17 12:00    Received: 07/11/17 10:00    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		07/13/17 13:59	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		07/13/17 13:59	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		07/13/17 13:59	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/17/17 12:01	07/19/17 04:18	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/17/17 12:01	07/19/17 04:18	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/17/17 12:01	07/19/17 04:18	7440-38-2	
Barium, Dissolved	25.2	ug/L	10.0	0.22	1	07/17/17 12:01	07/19/17 04:18	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/17/17 12:01	07/19/17 04:18	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/17/17 12:01	07/19/17 04:18	7440-43-9	
Calcium, Dissolved	60600	ug/L	500	24.7	1	07/17/17 12:01	07/19/17 04:18	7440-70-2	
Chromium, Dissolved	0.87J	ug/L	10.0	0.50	1	07/17/17 12:01	07/19/17 04:18	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/17/17 12:01	07/19/17 04:18	7440-48-4	
Copper, Dissolved	0.91J	ug/L	10.0	0.83	1	07/17/17 12:01	07/19/17 04:18	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/17/17 12:01	07/19/17 04:18	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/17/17 12:01	07/19/17 04:18	7439-92-1	
Magnesium, Dissolved	21600	ug/L	500	2.6	1	07/17/17 12:01	07/19/17 04:18	7439-95-4	
Manganese, Dissolved	33.0	ug/L	5.0	0.38	1	07/17/17 12:01	07/19/17 04:18	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/17/17 12:01	07/19/17 04:18	7440-02-0	
Potassium, Dissolved	3490	ug/L	2500	126	1	07/17/17 12:01	07/19/17 04:18	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/17/17 12:01	07/19/17 04:18	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/17/17 12:01	07/19/17 04:18	7440-22-4	
Sodium, Dissolved	24900	ug/L	1000	44.6	1	07/17/17 12:01	07/19/17 04:18	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	07/17/17 12:01	07/19/17 04:18	7440-28-0	
Vanadium, Dissolved	6.5J	ug/L	15.0	0.42	1	07/17/17 12:01	07/19/17 04:18	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	07/17/17 12:01	07/19/17 04:18	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	0.070J	ug/L	0.20	0.062	1	07/17/17 09:23	07/19/17 13:47	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	266	mg/L	5.0	1.4	1		07/13/17 12:20		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	331	mg/L	10.0	5.0	1		07/13/17 15:35		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		07/13/17 15:17	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.1	mg/L	1.2	0.10	1		07/11/17 20:22	16887-00-6	
Nitrate as N	1.1	mg/L	0.10	0.013	1		07/11/17 20:22	14797-55-8	H3
Sulfate	10.3	mg/L	1.2	0.16	1		07/14/17 14:18	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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**Sample: MW20D-GW-070717**      **Lab ID: 10395116002**      Collected: 07/07/17 12:00      Received: 07/11/17 10:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.2</b>	mg/L	0.020	0.0075	1		07/12/17 12:18		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	07/24/17 09:28	07/24/17 16:07		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>1.6</b>	mg/L	1.0	0.20	1		07/14/17 20:39	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

QC Batch: 484905 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2640035 Matrix: Water  
Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	07/13/17 13:37	
Ethene	ug/L	<0.68	10.0	0.68	07/13/17 13:37	
Methane	ug/L	1.7J	10.0	1.1	07/13/17 13:37	

LABORATORY CONTROL SAMPLE & LCSD: 2640036

Parameter	Units	2640037								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	112	109	99	96	85-115	3	20	
Ethene	ug/L	106	106	102	100	96	85-115	4	20	
Methane	ug/L	60.7	60.2	57.8	99	95	85-115	4	20	

SAMPLE DUPLICATE: 2640038

Parameter	Units	10395116001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.9J	1.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

QC Batch: 484460 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2638089 Matrix: Water  
Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	07/19/17 13:40	

LABORATORY CONTROL SAMPLE: 2638090

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2638091 2638092

Parameter	Units	10395145005 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	Max		Qual
			Spike Conc.	Conc.	Spike Conc.	Conc.					RPD	RPD	
Mercury, Dissolved	ug/L	ND	5	5	5.0	5.2	99	104	80-120	5	20		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

QC Batch: 484449	Analysis Method: 6010C Met
QC Batch Method: EPA 3010	Analysis Description: 6010C Water Dissolved
Associated Lab Samples: 10395116001, 10395116002	

METHOD BLANK: 2638047 Matrix: Water

Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	07/19/17 03:59	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	07/19/17 03:59	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	07/19/17 03:59	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	07/19/17 03:59	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	07/19/17 03:59	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	07/19/17 03:59	
Calcium, Dissolved	ug/L	<24.7	500	24.7	07/19/17 03:59	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	07/19/17 03:59	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	07/19/17 03:59	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	07/19/17 03:59	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	07/19/17 03:59	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	07/19/17 03:59	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	07/19/17 03:59	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	07/19/17 03:59	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	07/19/17 03:59	
Potassium, Dissolved	ug/L	<126	2500	126	07/19/17 03:59	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	07/19/17 03:59	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	07/19/17 03:59	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	07/19/17 03:59	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	07/19/17 03:59	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	07/19/17 03:59	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	07/19/17 03:59	

LABORATORY CONTROL SAMPLE: 2638048

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	104	80-120	
Antimony, Dissolved	ug/L	1000	1010	101	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1010	101	80-120	
Beryllium, Dissolved	ug/L	1000	1020	102	80-120	
Cadmium, Dissolved	ug/L	1000	1010	101	80-120	
Calcium, Dissolved	ug/L	20000	19700	99	80-120	
Chromium, Dissolved	ug/L	1000	996	100	80-120	
Cobalt, Dissolved	ug/L	1000	999	100	80-120	
Copper, Dissolved	ug/L	1000	989	99	80-120	
Iron, Dissolved	ug/L	20000	20000	100	80-120	
Lead, Dissolved	ug/L	1000	1020	102	80-120	
Magnesium, Dissolved	ug/L	20000	20300	101	80-120	
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

LABORATORY CONTROL SAMPLE: 2638048

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1010	101	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1060	106	80-120	
Silver, Dissolved	ug/L	500	498	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	99	80-120	
Thallium, Dissolved	ug/L	1000	1000	100	80-120	
Vanadium, Dissolved	ug/L	1000	979	98	80-120	
Zinc, Dissolved	ug/L	1000	1020	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2638049 2638050

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10395116001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	<8.6	20000	20000	20800	21100	104	105	75-125	1	20
Antimony, Dissolved	ug/L	<3.1	1000	1000	1020	1040	102	104	75-125	2	20
Arsenic, Dissolved	ug/L	<5.2	1000	1000	1020	1030	102	103	75-125	1	20
Barium, Dissolved	ug/L	11.0	1000	1000	1020	1030	101	102	75-125	1	20
Beryllium, Dissolved	ug/L	<0.11	1000	1000	1030	1040	103	104	75-125	1	20
Cadmium, Dissolved	ug/L	<0.46	1000	1000	1010	1020	101	102	75-125	1	20
Calcium, Dissolved	ug/L	38700	20000	20000	59300	59000	103	101	75-125	1	20
Chromium, Dissolved	ug/L	<0.50	1000	1000	993	1000	99	100	75-125	1	20
Cobalt, Dissolved	ug/L	<1.1	1000	1000	980	991	98	99	75-125	1	20
Copper, Dissolved	ug/L	<0.83	1000	1000	998	1010	100	101	75-125	1	20
Iron, Dissolved	ug/L	<16.7	20000	20000	20100	20300	100	101	75-125	1	20
Lead, Dissolved	ug/L	<3.0	1000	1000	1010	1020	101	102	75-125	1	20
Magnesium, Dissolved	ug/L	14800	20000	20000	35200	35300	102	103	75-125	0	20
Manganese, Dissolved	ug/L	3.4J	1000	1000	1000	1010	100	101	75-125	1	20
Nickel, Dissolved	ug/L	<1.1	1000	1000	987	996	99	100	75-125	1	20
Potassium, Dissolved	ug/L	2780	20000	20000	23500	23600	103	104	75-125	1	20
Selenium, Dissolved	ug/L	<6.4	1000	1000	1050	1060	105	106	75-125	1	20
Silver, Dissolved	ug/L	<0.27	500	500	502	507	100	101	75-125	1	20
Sodium, Dissolved	ug/L	16000	20000	20000	36300	36200	102	101	75-125	0	20
Thallium, Dissolved	ug/L	<4.8	1000	1000	984	996	98	99	75-125	1	20
Vanadium, Dissolved	ug/L	10.2J	1000	1000	997	1010	99	100	75-125	1	20
Zinc, Dissolved	ug/L	<1.8	1000	1000	1010	1010	100	101	75-125	1	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

QC Batch: 484840 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2639687 Matrix: Water  
Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	07/13/17 10:47	

LABORATORY CONTROL SAMPLE & LCSD: 2639688 2639689

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	42.3	42.3	106	106	90-110	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2639690 2639691

Parameter	Units	10395145005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	141	40	40	188	187	117	116	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2639692 2639693

Parameter	Units	10395360003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	532	40	40	564	581	81	123	80-120	3	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

QC Batch: 484895

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2639992

Matrix: Water

Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	07/13/17 15:35	

LABORATORY CONTROL SAMPLE: 2639993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	944	94	80-120	

SAMPLE DUPLICATE: 2639994

Parameter	Units	10395145005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	198	199	1	10	

SAMPLE DUPLICATE: 2639995

Parameter	Units	10395145006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	<5.0		10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

QC Batch: 84562 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 360263 Matrix: Water

Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	07/13/17 15:15	

LABORATORY CONTROL SAMPLE: 360264

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.20	99	90-110	

MATRIX SPIKE SAMPLE: 360266

Parameter	Units	2057480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.019J	10	75-125	M1

SAMPLE DUPLICATE: 360265

Parameter	Units	2057480001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

QC Batch: 484226 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2636980 Matrix: Water  
Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.26J	1.2	0.10	07/11/17 13:35	
Nitrate as N	mg/L	<0.013	0.10	0.013	07/11/17 13:35	
Sulfate	mg/L	<0.16	1.2	0.16	07/11/17 13:35	

LABORATORY CONTROL SAMPLE: 2636981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.2	98	90-110	
Nitrate as N	mg/L	1	0.93	93	90-110	
Sulfate	mg/L	12.5	11.7	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2636982 2636983

Parameter	Units	10394827001		2636982		2636983		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	13.4	12.5	12.5	24.3	24.3	87	88	90-110	0	20	M1	
Nitrate as N	mg/L	ND	1	1	0.12	0.12	12	12	90-110	2	20	M1	
Sulfate	mg/L	4490	1250	1250	5870	5980	111	119	90-110	2	20	M6	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2636984 2636985

Parameter	Units	10394881004		2636984		2636985		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	55.8	12.5	12.5	60.1	60.3	34	36	90-110	0	20	M1	
Nitrate as N	mg/L	0.21	1	1	1.2	1.2	98	98	90-110	0	20		
Sulfate	mg/L	7.3	12.5	12.5	20.0	17.8	101	84	90-110	11	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

QC Batch: 484583 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2638453 Matrix: Water  
Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	07/12/17 12:21	

LABORATORY CONTROL SAMPLE: 2638454

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2638455 2638456

Parameter	Units	2638455		2638456		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	9.5	10	19.2	10	97	85	90-110	6	20	M6		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2638457 2638458

Parameter	Units	2638457		2638458		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	1.9	1	2.8	1	91	89	90-110	1	20	E,M1		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395116

QC Batch: 486820 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 2650140 Matrix: Water  
Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	07/24/17 16:06	

LABORATORY CONTROL SAMPLE: 2650141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	307	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2650142 2650143

Parameter	Units	10395020001 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Chemical Oxygen Demand	mg/L	ND	250	250	276	289	102	107	90-110	5	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2650144 2650145

Parameter	Units	10395116001 Result	MS		MSD		% Rec	MSD	% Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Chemical Oxygen Demand	mg/L	<15.8	250	250	261	259	103	102	90-110	1	20		

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

QC Batch: 119418 Analysis Method: SM 5310C  
 QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
 Associated Lab Samples: 10395116001, 10395116002

METHOD BLANK: 473126 Matrix: Water

Associated Lab Samples: 10395116001, 10395116002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	07/14/17 15:00	

LABORATORY CONTROL SAMPLE: 473127

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	26.9	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 473128 473129

Parameter	Units	1291475001		473129		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Total Organic Carbon	mg/L	1.6	25	25	30.1	30.7	114	117	80-120	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 473130 473131

Parameter	Units	10395007001		473131		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Total Organic Carbon	mg/L	5.6	25	25	33.4	33.6	112	112	80-120	0	20		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395116

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10395116001	MW15D-GW-070717	RSK 175	484905		
10395116002	MW20D-GW-070717	RSK 175	484905		
10395116001	MW15D-GW-070717	EPA 3010	484449	6010C Met	485635
10395116002	MW20D-GW-070717	EPA 3010	484449	6010C Met	485635
10395116001	MW15D-GW-070717	EPA 7470A	484460	EPA 7470A	485584
10395116002	MW20D-GW-070717	EPA 7470A	484460	EPA 7470A	485584
10395116001	MW15D-GW-070717	SM 2320B	484840		
10395116002	MW20D-GW-070717	SM 2320B	484840		
10395116001	MW15D-GW-070717	SM 2540C	484895		
10395116002	MW20D-GW-070717	SM 2540C	484895		
10395116001	MW15D-GW-070717	SM 4500-S-2 D	84562		
10395116002	MW20D-GW-070717	SM 4500-S-2 D	84562		
10395116001	MW15D-GW-070717	EPA 300.0	484226		
10395116002	MW20D-GW-070717	EPA 300.0	484226		
10395116001	MW15D-GW-070717	EPA 353.2	484583		
10395116002	MW20D-GW-070717	EPA 353.2	484583		
10395116001	MW15D-GW-070717	EPA 410.4	486820	EPA 410.4	486977
10395116002	MW20D-GW-070717	EPA 410.4	486820	EPA 410.4	486977
10395116001	MW15D-GW-070717	SM 5310C	119418		
10395116002	MW20D-GW-070717	SM 5310C	119418		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10395116

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Theriault	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com		Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221	
Email:		Purchase Order # PEDD# 1497		Pace Quote: Contract# 758938	
Phone:		Project Name: UPRR Freeman		Pace Project Manager: Jennifer Gross	
Requested Due Date: 10 Day Standard		Project #: 1497		Pace Profile #: 36447 / 4	
Regulatory Agency					
State / Location					
WA / Freeman					

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test Y/N	Requested Analysis Filtered (Y/N)	Y	Y													
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn-Acetate	Other	Low Level VOCs by 8260					6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate, 300.0	2540 TDS	TOC 6310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	BOD 10360WLL	Nitrate+Nitrite 353.2	CSIA of CTET (8260 Analysis Required)		
						DATE	TIME	DATE	TIME																										
1	MW15D-GW-070717	WT	G					7/7/17	09:20	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									001
2	MW20D-GW-070717	WT	G					7/7/17	12:00	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								002
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCERTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	AKS/CH2M	7/10/17	1422	Manna PACE	7/11/17	1000	1.4 Y Y Y
*Field filtered by client							

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: L Baumann					
SIGNATURE of SAMPLER: [Signature]	DATE Signed: 7/10/17				

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name: **CH2M UPRR** Project #: **WO# : 10395116**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other:

Tracking Number: **7367 5326 0471**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Temp Blank?  Yes  No

Thermometer Used:  151401163  151401164

Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **1.4** Cooler Temp Corrected (°C): **1.4** Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: **TRUE** Date and Initials of Person Examining Contents: **ME 7-11-17**

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

			COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		12.
-Includes Date/Time/ID/Analysis Matrix: <b>wt</b>			
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide; NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Sample # <b>1-2 '1 '1 '1</b>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: Date/Time: Field Data Required?  Yes  No

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1038</b>	Temp: <b>1.4</b>	Corrected Temp: <b>1.4</b>
Time: <b>put in cooler</b>		
Time: <b>1045</b>	Temp:	Corrected Temp:

Project Manager Review:

JENNI GROSS Date: **07/11/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

WO#: 2057498



Workorder: 10395116

Workorder Name: 1497 UPRR\_Freeman

Client Received Date: 7/11/2017

Results Requested By: 7/25/2017

Report To		Subcontract To				Requested Analysis																																			
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333				<div style="display: flex; justify-content: space-between;"> <span style="writing-mode: vertical-rl; transform: rotate(180deg);">5636267 / 4500 Sulfide</span> <table border="1" style="width: 100%; height: 100%;"> <tr> <th colspan="12">Requested Analysis</th> </tr> <tr> <td colspan="12" style="text-align: center;">LAB USE ONLY</td> </tr> </table> </div>												Requested Analysis												LAB USE ONLY											
Requested Analysis																																									
LAB USE ONLY																																									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Other																							
1	MW15D-GW-070717	PS	7/7/2017 09:20	10395116001	Water													1																							
2	MW20D-GW-070717	PS	7/7/2017 12:00	10395116002	Water													1																							
3																																									
4																																									
5																																									
Transfers												Comments																													
Transfers	Released By	Date/Time	Received By	Date/Time																																					
1	<i>[Signature]</i> Pace MN	7/11/17 1315	<i>[Signature]</i> Fed Ex																																						
2	Fed Ex	7-2-17 8:10	<i>[Signature]</i> A-Z / PAC	7-2-17 8:20																																					
3																																									
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact																																			
3.3 °C		Y or N		Y or N		Y or N																																			

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Sample Condition Upon

WO#: 2057498

PM: CMM

Due Date: 07/25/17

Pr

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 7/12/17 CMM

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present??	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<i>CMM</i> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

## WO#: 1291419

PM: HRZ      Due Date: 07/25/17  
CLIENT: PACE MPLS

Workorder: 10395116      Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 7/11/2017      Results Requested By: 7/20/2017

Report To		Subcontract To				Requested Analysis																			
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										Other	LAB USE ONLY								
1	MW15D-GW-070717	PS	7/7/2017 09:20	10395116001	Water	2											X								
2	MW20D-GW-070717	PS	7/7/2017 12:00	10395116002	Water	2											X								
3																									
4																									
5																									

5632354 / 5310 TOC

Transfers						Comments														
Released By	Date/Time	Received By	Date/Time																	
<i>[Signature]</i> Pace MN	7/11/17 1315	<i>[Signature]</i>	7/11/17 1830																	
<i>[Signature]</i>	7/11/17 2200	<i>[Signature]</i>	7/11/17 0800																	

Cooler Temperature on Receipt 3.2 °C      Custody Seal  or N      Received on Ice  or N      Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MLV

WO#: **1291419**

Courier:  Fed Ex  UPS  USPS  Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: HOOPAC      Temp Blank?  Yes  No

Thermometer Used:  140792808      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.9      Cooler Temp Corrected °C: 3.2      Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C      Correction Factor: 0.3      Date and Initials of Person Examining Contents: JPC 7/11/17  
MW 7/12/17

Comments: \_\_\_\_\_

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**      Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N      TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature]      Date: 7-12-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 14, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

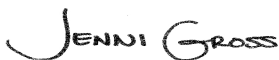
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395459

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10395459001	MW21D-GW-071117	Water	07/11/17 14:10	07/13/17 09:20
10395459002	TB-071117	Water	07/11/17 07:00	07/13/17 09:20

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10395459001	MW21D-GW-071117	EPA 8260B	DJB	83	PASI-M
10395459002	TB-071117	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10395459001</b>	<b>MW21D-GW-071117</b>					
EPA 8260B	Acetone	18.4J	ug/L	20.0	07/14/17 00:58	

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** July 14, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 484882

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2639870)
- Acetone

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484882

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

Sample: MW21D-GW-071117 Lab ID: 10395459001 Collected: 07/11/17 14:10 Received: 07/13/17 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/14/17 00:58	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/14/17 00:58	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/14/17 00:58	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/14/17 00:58	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/14/17 00:58	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/14/17 00:58	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/14/17 00:58	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/14/17 00:58	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/14/17 00:58	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/14/17 00:58	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/14/17 00:58	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/14/17 00:58	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/14/17 00:58	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/14/17 00:58	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/14/17 00:58	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/14/17 00:58	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/14/17 00:58	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/14/17 00:58	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/14/17 00:58	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/14/17 00:58	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/14/17 00:58	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/14/17 00:58	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/14/17 00:58	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/14/17 00:58	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/14/17 00:58	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/14/17 00:58	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/14/17 00:58	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/14/17 00:58	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/14/17 00:58	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/14/17 00:58	108-10-1	
Acetone	18.4J	ug/L	20.0	0.64	1		07/14/17 00:58	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/14/17 00:58	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/14/17 00:58	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/14/17 00:58	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/14/17 00:58	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/14/17 00:58	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/14/17 00:58	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/14/17 00:58	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/14/17 00:58	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		07/14/17 00:58	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		07/14/17 00:58	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/14/17 00:58	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/14/17 00:58	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		07/14/17 00:58	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/14/17 00:58	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/14/17 00:58	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

**Sample:** MW21D-GW-071117      **Lab ID:** 10395459001      Collected: 07/11/17 14:10      Received: 07/13/17 09:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/14/17 00:58	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/14/17 00:58	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/14/17 00:58	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/14/17 00:58	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/14/17 00:58	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/14/17 00:58	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/14/17 00:58	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/14/17 00:58	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/14/17 00:58	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		07/14/17 00:58	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/14/17 00:58	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/14/17 00:58	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/14/17 00:58	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/14/17 00:58	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/14/17 00:58	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/14/17 00:58	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/14/17 00:58	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/14/17 00:58	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/14/17 00:58	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/14/17 00:58	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/14/17 00:58	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/14/17 00:58	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/14/17 00:58	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/14/17 00:58	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/14/17 00:58	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/14/17 00:58	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/14/17 00:58	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/14/17 00:58	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/14/17 00:58	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/14/17 00:58	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/14/17 00:58	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/14/17 00:58	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/14/17 00:58	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/14/17 00:58	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	108	%	75-137		1		07/14/17 00:58	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		07/14/17 00:58	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		07/14/17 00:58	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

Sample: **TB-071117** Lab ID: **10395459002** Collected: 07/11/17 07:00 Received: 07/13/17 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 23:31	630-20-6	
1,1,1-Trichloroethane	<0.057	ug/L	0.50	0.057	1		07/13/17 23:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 23:31	79-34-5	
1,1,2-Trichloroethane	<0.064	ug/L	0.50	0.064	1		07/13/17 23:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.13	ug/L	1.0	0.13	1		07/13/17 23:31	76-13-1	
1,1-Dichloroethane	<0.055	ug/L	0.50	0.055	1		07/13/17 23:31	75-34-3	
1,1-Dichloroethene	<0.069	ug/L	0.50	0.069	1		07/13/17 23:31	75-35-4	
1,1-Dichloropropene	<0.082	ug/L	0.50	0.082	1		07/13/17 23:31	563-58-6	
1,2,3-Trichlorobenzene	<0.17	ug/L	1.0	0.17	1		07/13/17 23:31	87-61-6	
1,2,3-Trichloropropane	<0.19	ug/L	4.0	0.19	1		07/13/17 23:31	96-18-4	
1,2,4-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		07/13/17 23:31	120-82-1	
1,2,4-Trimethylbenzene	<0.068	ug/L	1.0	0.068	1		07/13/17 23:31	95-63-6	
1,2-Dibromo-3-chloropropane	<0.60	ug/L	4.0	0.60	1		07/13/17 23:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.092	ug/L	0.50	0.092	1		07/13/17 23:31	106-93-4	
1,2-Dichlorobenzene	<0.078	ug/L	0.50	0.078	1		07/13/17 23:31	95-50-1	
1,2-Dichloroethane	<0.072	ug/L	0.50	0.072	1		07/13/17 23:31	107-06-2	
1,2-Dichloroethene (Total)	<0.16	ug/L	1.0	0.16	1		07/13/17 23:31	540-59-0	
1,2-Dichloropropane	<0.066	ug/L	4.0	0.066	1		07/13/17 23:31	78-87-5	
1,3,5-Trimethylbenzene	<0.042	ug/L	0.50	0.042	1		07/13/17 23:31	108-67-8	
1,3-Dichlorobenzene	<0.085	ug/L	0.50	0.085	1		07/13/17 23:31	541-73-1	
1,3-Dichloropropane	<0.059	ug/L	0.50	0.059	1		07/13/17 23:31	142-28-9	
1,4-Dichlorobenzene	<0.081	ug/L	0.50	0.081	1		07/13/17 23:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<4.8	ug/L	200	4.8	1		07/13/17 23:31	123-91-1	
2,2,4-Trimethylpentane	<0.087	ug/L	4.0	0.087	1		07/13/17 23:31	540-84-1	
2,2-Dichloropropane	<0.096	ug/L	1.0	0.096	1		07/13/17 23:31	594-20-7	
2-Butanone (MEK)	<1.1	ug/L	5.0	1.1	1		07/13/17 23:31	78-93-3	
2-Chlorotoluene	<0.084	ug/L	0.50	0.084	1		07/13/17 23:31	95-49-8	
2-Hexanone	<0.19	ug/L	5.0	0.19	1		07/13/17 23:31	591-78-6	
4-Chlorotoluene	<0.048	ug/L	0.50	0.048	1		07/13/17 23:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.80	ug/L	5.0	0.80	1		07/13/17 23:31	108-10-1	
Acetone	<0.64	ug/L	20.0	0.64	1		07/13/17 23:31	67-64-1	
Acrolein	<2.1	ug/L	10.0	2.1	1		07/13/17 23:31	107-02-8	
Acrylonitrile	<0.49	ug/L	10.0	0.49	1		07/13/17 23:31	107-13-1	
Benzene	<0.042	ug/L	0.50	0.042	1		07/13/17 23:31	71-43-2	
Bromobenzene	<0.087	ug/L	0.50	0.087	1		07/13/17 23:31	108-86-1	
Bromochloromethane	<0.082	ug/L	1.0	0.082	1		07/13/17 23:31	74-97-5	
Bromodichloromethane	<0.068	ug/L	0.50	0.068	1		07/13/17 23:31	75-27-4	
Bromoform	<0.11	ug/L	4.0	0.11	1		07/13/17 23:31	75-25-2	
Bromomethane	<0.20	ug/L	4.0	0.20	1		07/13/17 23:31	74-83-9	
Carbon disulfide	<0.20	ug/L	1.0	0.20	1		07/13/17 23:31	75-15-0	
Carbon tetrachloride	<0.079	ug/L	0.50	0.079	1		07/13/17 23:31	56-23-5	
Chlorobenzene	<0.066	ug/L	0.50	0.066	1		07/13/17 23:31	108-90-7	
Chloroethane	<0.12	ug/L	1.0	0.12	1		07/13/17 23:31	75-00-3	
Chloroform	<0.21	ug/L	1.0	0.21	1		07/13/17 23:31	67-66-3	
Chloromethane	<0.080	ug/L	4.0	0.080	1		07/13/17 23:31	74-87-3	
Dibromochloromethane	<0.048	ug/L	0.50	0.048	1		07/13/17 23:31	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

**Sample:** TB-071117      **Lab ID:** 10395459002      Collected: 07/11/17 07:00      Received: 07/13/17 09:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.14	ug/L	1.0	0.14	1		07/13/17 23:31	74-95-3	
Dichlorodifluoromethane	<0.075	ug/L	1.0	0.075	1		07/13/17 23:31	75-71-8	
Dichlorofluoromethane	<0.054	ug/L	1.0	0.054	1		07/13/17 23:31	75-43-4	
Diisopropyl ether	<0.050	ug/L	1.0	0.050	1		07/13/17 23:31	108-20-3	
Ethyl-tert-butyl ether	<0.062	ug/L	0.50	0.062	1		07/13/17 23:31	637-92-3	
Ethylbenzene	<0.075	ug/L	0.50	0.075	1		07/13/17 23:31	100-41-4	
Hexachloro-1,3-butadiene	<0.13	ug/L	1.0	0.13	1		07/13/17 23:31	87-68-3	
Isopropylbenzene (Cumene)	<0.064	ug/L	0.50	0.064	1		07/13/17 23:31	98-82-8	
Methyl-tert-butyl ether	<0.047	ug/L	0.50	0.047	1		07/13/17 23:31	1634-04-4	
Methylene Chloride	<0.097	ug/L	4.0	0.097	1		07/13/17 23:31	75-09-2	
Naphthalene	<0.064	ug/L	4.0	0.064	1		07/13/17 23:31	91-20-3	
Styrene	<0.056	ug/L	0.50	0.056	1		07/13/17 23:31	100-42-5	
Tetrachloroethene	<0.13	ug/L	0.50	0.13	1		07/13/17 23:31	127-18-4	
Tetrahydrofuran	<1.5	ug/L	10.0	1.5	1		07/13/17 23:31	109-99-9	
Toluene	<0.059	ug/L	0.50	0.059	1		07/13/17 23:31	108-88-3	
Trichloroethene	<0.044	ug/L	0.40	0.044	1		07/13/17 23:31	79-01-6	
Trichlorofluoromethane	<0.055	ug/L	0.50	0.055	1		07/13/17 23:31	75-69-4	
Vinyl acetate	<0.12	ug/L	10.0	0.12	1		07/13/17 23:31	108-05-4	
Vinyl chloride	<0.098	ug/L	0.20	0.098	1		07/13/17 23:31	75-01-4	
Xylene (Total)	<0.15	ug/L	1.5	0.15	1		07/13/17 23:31	1330-20-7	
cis-1,2-Dichloroethene	<0.12	ug/L	0.50	0.12	1		07/13/17 23:31	156-59-2	
cis-1,3-Dichloropropene	<0.069	ug/L	0.50	0.069	1		07/13/17 23:31	10061-01-5	
m&p-Xylene	<0.11	ug/L	1.0	0.11	1		07/13/17 23:31	179601-23-1	
n-Butylbenzene	<0.16	ug/L	0.50	0.16	1		07/13/17 23:31	104-51-8	
n-Propylbenzene	<0.049	ug/L	0.50	0.049	1		07/13/17 23:31	103-65-1	
o-Xylene	<0.044	ug/L	0.50	0.044	1		07/13/17 23:31	95-47-6	
p-Isopropyltoluene	<0.064	ug/L	0.50	0.064	1		07/13/17 23:31	99-87-6	
sec-Butylbenzene	<0.094	ug/L	0.50	0.094	1		07/13/17 23:31	135-98-8	
tert-Amylmethyl ether	<0.073	ug/L	0.50	0.073	1		07/13/17 23:31	994-05-8	
tert-Butyl Alcohol	<0.89	ug/L	10.0	0.89	1		07/13/17 23:31	75-65-0	
tert-Butylbenzene	<0.051	ug/L	0.50	0.051	1		07/13/17 23:31	98-06-6	
trans-1,2-Dichloroethene	<0.15	ug/L	0.50	0.15	1		07/13/17 23:31	156-60-5	
trans-1,3-Dichloropropene	<0.044	ug/L	0.50	0.044	1		07/13/17 23:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<0.45	ug/L	10.0	0.45	1		07/13/17 23:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		07/13/17 23:31	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		07/13/17 23:31	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		07/13/17 23:31	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395459

QC Batch: 484882 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10395459001, 10395459002

METHOD BLANK: 2639868 Matrix: Water  
Associated Lab Samples: 10395459001, 10395459002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.064	0.50	0.064	07/13/17 23:10	
1,1,1-Trichloroethane	ug/L	<0.057	0.50	0.057	07/13/17 23:10	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	0.50	0.055	07/13/17 23:10	
1,1,2-Trichloroethane	ug/L	<0.064	0.50	0.064	07/13/17 23:10	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	1.0	0.13	07/13/17 23:10	
1,1-Dichloroethane	ug/L	<0.055	0.50	0.055	07/13/17 23:10	
1,1-Dichloroethene	ug/L	<0.069	0.50	0.069	07/13/17 23:10	
1,1-Dichloropropene	ug/L	<0.082	0.50	0.082	07/13/17 23:10	
1,2,3-Trichlorobenzene	ug/L	<0.17	1.0	0.17	07/13/17 23:10	MN
1,2,3-Trichloropropane	ug/L	<0.19	4.0	0.19	07/13/17 23:10	
1,2,4-Trichlorobenzene	ug/L	<0.14	1.0	0.14	07/13/17 23:10	MN
1,2,4-Trimethylbenzene	ug/L	<0.068	1.0	0.068	07/13/17 23:10	MN
1,2-Dibromo-3-chloropropane	ug/L	<0.60	4.0	0.60	07/13/17 23:10	
1,2-Dibromoethane (EDB)	ug/L	<0.092	0.50	0.092	07/13/17 23:10	
1,2-Dichlorobenzene	ug/L	<0.078	0.50	0.078	07/13/17 23:10	
1,2-Dichloroethane	ug/L	<0.072	0.50	0.072	07/13/17 23:10	
1,2-Dichloroethene (Total)	ug/L	<0.16	1.0	0.16	07/13/17 23:10	
1,2-Dichloropropane	ug/L	<0.066	4.0	0.066	07/13/17 23:10	
1,3,5-Trimethylbenzene	ug/L	<0.042	0.50	0.042	07/13/17 23:10	
1,3-Dichlorobenzene	ug/L	<0.085	0.50	0.085	07/13/17 23:10	
1,3-Dichloropropane	ug/L	<0.059	0.50	0.059	07/13/17 23:10	
1,4-Dichlorobenzene	ug/L	<0.081	0.50	0.081	07/13/17 23:10	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	200	4.8	07/13/17 23:10	
2,2,4-Trimethylpentane	ug/L	<0.087	4.0	0.087	07/13/17 23:10	
2,2-Dichloropropane	ug/L	<0.096	1.0	0.096	07/13/17 23:10	
2-Butanone (MEK)	ug/L	<1.1	5.0	1.1	07/13/17 23:10	
2-Chlorotoluene	ug/L	<0.084	0.50	0.084	07/13/17 23:10	
2-Hexanone	ug/L	<0.19	5.0	0.19	07/13/17 23:10	
4-Chlorotoluene	ug/L	<0.048	0.50	0.048	07/13/17 23:10	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	5.0	0.80	07/13/17 23:10	
Acetone	ug/L	<0.64	20.0	0.64	07/13/17 23:10	
Acrolein	ug/L	<2.1	10.0	2.1	07/13/17 23:10	
Acrylonitrile	ug/L	<0.49	10.0	0.49	07/13/17 23:10	
Benzene	ug/L	<0.042	0.50	0.042	07/13/17 23:10	
Bromobenzene	ug/L	<0.087	0.50	0.087	07/13/17 23:10	
Bromochloromethane	ug/L	<0.082	1.0	0.082	07/13/17 23:10	
Bromodichloromethane	ug/L	<0.068	0.50	0.068	07/13/17 23:10	
Bromoform	ug/L	<0.11	4.0	0.11	07/13/17 23:10	
Bromomethane	ug/L	<0.20	4.0	0.20	07/13/17 23:10	
Carbon disulfide	ug/L	<0.20	1.0	0.20	07/13/17 23:10	
Carbon tetrachloride	ug/L	<0.079	0.50	0.079	07/13/17 23:10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

METHOD BLANK: 2639868

Matrix: Water

Associated Lab Samples: 10395459001, 10395459002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.066	0.50	0.066	07/13/17 23:10	
Chloroethane	ug/L	<0.12	1.0	0.12	07/13/17 23:10	
Chloroform	ug/L	<0.21	1.0	0.21	07/13/17 23:10	
Chloromethane	ug/L	<0.080	4.0	0.080	07/13/17 23:10	
cis-1,2-Dichloroethene	ug/L	<0.12	0.50	0.12	07/13/17 23:10	
cis-1,3-Dichloropropene	ug/L	<0.069	0.50	0.069	07/13/17 23:10	
Dibromochloromethane	ug/L	<0.048	0.50	0.048	07/13/17 23:10	
Dibromomethane	ug/L	<0.14	1.0	0.14	07/13/17 23:10	
Dichlorodifluoromethane	ug/L	<0.075	1.0	0.075	07/13/17 23:10	
Dichlorofluoromethane	ug/L	<0.054	1.0	0.054	07/13/17 23:10	
Diisopropyl ether	ug/L	<0.050	1.0	0.050	07/13/17 23:10	
Ethyl-tert-butyl ether	ug/L	<0.062	0.50	0.062	07/13/17 23:10	
Ethylbenzene	ug/L	<0.075	0.50	0.075	07/13/17 23:10	
Hexachloro-1,3-butadiene	ug/L	<0.13	1.0	0.13	07/13/17 23:10	
Isopropylbenzene (Cumene)	ug/L	<0.064	0.50	0.064	07/13/17 23:10	
m&p-Xylene	ug/L	<0.11	1.0	0.11	07/13/17 23:10	
Methyl-tert-butyl ether	ug/L	<0.047	0.50	0.047	07/13/17 23:10	
Methylene Chloride	ug/L	<0.097	4.0	0.097	07/13/17 23:10	
n-Butylbenzene	ug/L	<0.16	0.50	0.16	07/13/17 23:10	
n-Propylbenzene	ug/L	<0.049	0.50	0.049	07/13/17 23:10	
Naphthalene	ug/L	<0.064	4.0	0.064	07/13/17 23:10	MN
o-Xylene	ug/L	<0.044	0.50	0.044	07/13/17 23:10	
p-Isopropyltoluene	ug/L	<0.064	0.50	0.064	07/13/17 23:10	
sec-Butylbenzene	ug/L	<0.094	0.50	0.094	07/13/17 23:10	
Styrene	ug/L	<0.056	0.50	0.056	07/13/17 23:10	
tert-Amylmethyl ether	ug/L	<0.073	0.50	0.073	07/13/17 23:10	
tert-Butyl Alcohol	ug/L	<0.89	10.0	0.89	07/13/17 23:10	
tert-Butylbenzene	ug/L	<0.051	0.50	0.051	07/13/17 23:10	
Tetrachloroethene	ug/L	<0.13	0.50	0.13	07/13/17 23:10	
Tetrahydrofuran	ug/L	<1.5	10.0	1.5	07/13/17 23:10	
Toluene	ug/L	<0.059	0.50	0.059	07/13/17 23:10	
trans-1,2-Dichloroethene	ug/L	<0.15	0.50	0.15	07/13/17 23:10	
trans-1,3-Dichloropropene	ug/L	<0.044	0.50	0.044	07/13/17 23:10	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	10.0	0.45	07/13/17 23:10	
Trichloroethene	ug/L	<0.044	0.40	0.044	07/13/17 23:10	
Trichlorofluoromethane	ug/L	<0.055	0.50	0.055	07/13/17 23:10	
Vinyl acetate	ug/L	<0.12	10.0	0.12	07/13/17 23:10	
Vinyl chloride	ug/L	<0.098	0.20	0.098	07/13/17 23:10	
Xylene (Total)	ug/L	<0.15	1.5	0.15	07/13/17 23:10	
1,2-Dichloroethane-d4 (S)	%	105	75-137		07/13/17 23:10	
4-Bromofluorobenzene (S)	%	105	75-125		07/13/17 23:10	
Toluene-d8 (S)	%	98	75-125		07/13/17 23:10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

LABORATORY CONTROL SAMPLE & LCSD: 2639869		2639870									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	21.0	19.6	105	98	75-136	7	30		
1,1,1-Trichloroethane	ug/L	20	20.1	19.7	101	99	75-129	2	30		
1,1,2,2-Tetrachloroethane	ug/L	20	20.1	19.5	101	98	71-138	3	30		
1,1,2-Trichloroethane	ug/L	20	21.1	19.9	106	99	75-125	6	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.8	19.2	99	96	69-126	3	30		
1,1-Dichloroethane	ug/L	20	20.2	19.7	101	99	75-125	2	30		
1,1-Dichloroethene	ug/L	20	19.4	19.8	97	99	75-125	2	30		
1,1-Dichloropropene	ug/L	20	19.8	19.2	99	96	75-125	3	30		
1,2,3-Trichlorobenzene	ug/L	20	18.1	18.2	90	91	75-125	1	30		
1,2,3-Trichloropropane	ug/L	20	19.8	18.5	99	93	75-125	7	30		
1,2,4-Trichlorobenzene	ug/L	20	17.0	17.5	85	87	75-125	3	30		
1,2,4-Trimethylbenzene	ug/L	20	18.7	18.4	93	92	75-125	1	30		
1,2-Dibromo-3-chloropropane	ug/L	50	46.2	43.4	92	87	71-130	6	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.9	19.7	105	98	75-125	6	30		
1,2-Dichlorobenzene	ug/L	20	19.5	19.0	98	95	75-125	3	30		
1,2-Dichloroethane	ug/L	20	20.8	19.3	104	96	70-125	8	30		
1,2-Dichloroethene (Total)	ug/L	40	39.1	38.9	98	97	75-125	0	30		
1,2-Dichloropropane	ug/L	20	20.7	19.4	103	97	75-125	6	30		
1,3,5-Trimethylbenzene	ug/L	20	19.9	19.4	99	97	75-125	2	30		
1,3-Dichlorobenzene	ug/L	20	19.3	18.8	96	94	75-125	2	30		
1,3-Dichloropropane	ug/L	20	21.3	20.3	107	101	75-125	5	30		
1,4-Dichlorobenzene	ug/L	20	18.9	18.1	95	91	75-125	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	362	375	90	94	64-140	4	30		
2,2,4-Trimethylpentane	ug/L	20	18.3	19.0	92	95	68-125	3	30		
2,2-Dichloropropane	ug/L	20	18.1	17.6	91	88	70-131	3	30		
2-Butanone (MEK)	ug/L	100	104	86.5	104	86	69-125	18	30		
2-Chlorotoluene	ug/L	20	19.3	19.0	97	95	75-125	2	30		
2-Hexanone	ug/L	100	107	95.0	107	95	73-129	12	30		
4-Chlorotoluene	ug/L	20	20.3	19.9	101	99	75-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	104	97.6	104	98	73-125	6	30		
Acetone	ug/L	100	122	86.9	122	87	66-126	34	30	R1	
Acrolein	ug/L	200	206	200	103	100	56-150	3	30		
Acrylonitrile	ug/L	200	201	187	101	94	68-129	7	30		
Benzene	ug/L	20	19.5	19.1	98	95	75-125	2	30		
Bromobenzene	ug/L	20	19.3	18.6	97	93	75-125	4	30		
Bromochloromethane	ug/L	20	21.5	19.8	108	99	75-126	8	30		
Bromodichloromethane	ug/L	20	21.5	20.0	107	100	75-133	7	30		
Bromoform	ug/L	20	18.6	18.4	93	92	62-142	1	30		
Bromomethane	ug/L	20	16.3	17.6	81	88	34-143	8	30		
Carbon disulfide	ug/L	20	18.5	18.0	92	90	71-125	3	30		
Carbon tetrachloride	ug/L	20	20.3	19.6	102	98	71-145	4	30		
Chlorobenzene	ug/L	20	19.4	18.9	97	94	75-125	3	30		
Chloroethane	ug/L	20	20.8	20.2	104	101	75-125	3	30		
Chloroform	ug/L	20	19.2	18.7	96	94	75-125	3	30		
Chloromethane	ug/L	20	19.8	19.0	99	95	54-125	4	30		
cis-1,2-Dichloroethene	ug/L	20	20.2	19.9	101	100	75-125	2	30		
cis-1,3-Dichloropropene	ug/L	20	21.1	20.0	106	100	75-125	5	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395459

LABORATORY CONTROL SAMPLE & LCSD:		2639869		2639870							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	21.6	19.8	108	99	74-141	9	30		
Dibromomethane	ug/L	20	20.0	18.6	100	93	75-125	8	30		
Dichlorodifluoromethane	ug/L	20	19.6	19.7	98	98	59-130	0	30		
Dichlorofluoromethane	ug/L	20	20.0	20.0	100	100	75-125	0	30		
Diisopropyl ether	ug/L	20	20.2	19.2	101	96	69-125	5	30		
Ethyl-tert-butyl ether	ug/L	20	21.0	20.3	105	102	73-125	3	30		
Ethylbenzene	ug/L	20	19.0	18.6	95	93	75-125	2	30		
Hexachloro-1,3-butadiene	ug/L	20	18.4	18.7	92	94	75-131	2	30		
Isopropylbenzene (Cumene)	ug/L	20	19.8	19.9	99	100	75-125	0	30		
m&p-Xylene	ug/L	40	40.3	40.1	101	100	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	20.1	18.9	100	95	75-125	6	30		
Methylene Chloride	ug/L	20	20.7	19.4	104	97	73-125	7	30		
n-Butylbenzene	ug/L	20	19.6	19.6	98	98	75-125	0	30		
n-Propylbenzene	ug/L	20	19.2	18.9	96	95	75-125	1	30		
Naphthalene	ug/L	20	16.7	17.4	84	87	74-125	4	30		
o-Xylene	ug/L	20	20.1	19.8	100	99	75-125	1	30		
p-Isopropyltoluene	ug/L	20	19.7	19.8	99	99	75-125	0	30		
sec-Butylbenzene	ug/L	20	19.8	20.0	99	100	75-125	1	30		
Styrene	ug/L	20	21.1	20.3	105	101	75-125	4	30		
tert-Amylmethyl ether	ug/L	20	21.0	19.5	105	98	71-126	7	30		
tert-Butyl Alcohol	ug/L	200	188	183	94	92	69-131	3	30		
tert-Butylbenzene	ug/L	20	19.2	19.5	96	97	75-125	1	30		
Tetrachloroethene	ug/L	20	18.9	18.9	94	94	75-125	0	30		
Tetrahydrofuran	ug/L	200	222	204	111	102	65-127	9	30		
Toluene	ug/L	20	19.1	18.6	95	93	75-125	3	30		
trans-1,2-Dichloroethene	ug/L	20	18.9	19.0	94	95	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	20	20.6	19.7	103	98	75-125	4	30		
trans-1,4-Dichloro-2-butene	ug/L	50	42.7	40.0	85	80	30-150	7	30		
Trichloroethene	ug/L	20	20.6	19.8	103	99	75-125	4	30		
Trichlorofluoromethane	ug/L	20	20.0	19.6	100	98	71-140	2	30		
Vinyl acetate	ug/L	20	17.6	19.3	88	96	68-137	9	30		
Vinyl chloride	ug/L	20	19.7	19.6	99	98	70-125	0	30		
Xylene (Total)	ug/L	60	60.4	59.9	101	100	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				100	99	75-137				
4-Bromofluorobenzene (S)	%				100	103	75-125				
Toluene-d8 (S)	%				98	98	75-125				

MATRIX SPIKE SAMPLE:		2639871		10395465001							
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
1,1,1,2-Tetrachloroethane	ug/L	<0.064	20	21.8	109	75-137					
1,1,1-Trichloroethane	ug/L	<0.057	20	22.9	115	75-139					
1,1,2,2-Tetrachloroethane	ug/L	<0.055	20	20.3	102	60-142					
1,1,2-Trichloroethane	ug/L	<0.064	20	20.9	105	75-128					
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	20	24.4	122	62-150					

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

MATRIX SPIKE SAMPLE: 2639871		10395465001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.055	20	22.0	110	70-129	
1,1-Dichloroethene	ug/L	<0.069	20	23.1	115	67-141	
1,1-Dichloropropene	ug/L	<0.082	20	22.7	114	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.17	20	19.5	98	66-139	
1,2,3-Trichloropropane	ug/L	<0.19	20	18.9	94	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.14	20	19.0	95	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.068	20	19.8	99	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	50	45.7	91	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.092	20	20.5	102	74-129	
1,2-Dichlorobenzene	ug/L	<0.078	20	20.0	100	68-135	
1,2-Dichloroethane	ug/L	<0.072	20	20.7	103	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.16	40	43.8	109	69-134	
1,2-Dichloropropane	ug/L	<0.066	20	21.7	109	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.042	20	21.2	106	64-146	
1,3-Dichlorobenzene	ug/L	<0.085	20	20.0	100	69-135	
1,3-Dichloropropane	ug/L	<0.059	20	21.7	108	67-128	
1,4-Dichlorobenzene	ug/L	<0.081	20	19.5	98	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	400	414	104	58-140	
2,2,4-Trimethylpentane	ug/L	<0.087	20	24.7	124	48-150	
2,2-Dichloropropane	ug/L	<0.096	20	20.0	100	50-150	
2-Butanone (MEK)	ug/L	<1.1	100	91.1	91	58-125	
2-Chlorotoluene	ug/L	<0.084	20	20.3	101	65-138	
2-Hexanone	ug/L	<0.19	100	98.7	99	61-134	
4-Chlorotoluene	ug/L	<0.048	20	21.3	106	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	100	101	101	61-130	
Acetone	ug/L	<0.64	100	147	147	51-140 M1	
Acrolein	ug/L	<2.1	200	242	121	48-150	
Acrylonitrile	ug/L	<0.49	200	200	100	55-134	
Benzene	ug/L	<0.042	20	21.5	108	63-132	
Bromobenzene	ug/L	<0.087	20	19.2	96	67-138	
Bromochloromethane	ug/L	<0.082	20	21.4	107	66-138	
Bromodichloromethane	ug/L	<0.068	20	22.0	110	75-137	
Bromoform	ug/L	<0.11	20	18.8	94	65-129	
Bromomethane	ug/L	<0.20	20	21.2	106	41-150	
Carbon disulfide	ug/L	<0.20	20	21.3	106	72-132	
Carbon tetrachloride	ug/L	<0.079	20	23.9	119	75-150	
Chlorobenzene	ug/L	<0.066	20	20.4	102	73-127	
Chloroethane	ug/L	<0.12	20	24.8	124	74-138	
Chloroform	ug/L	<0.21	20	20.7	104	74-125	
Chloromethane	ug/L	<0.080	20	22.7	114	58-129	
cis-1,2-Dichloroethene	ug/L	<0.12	20	22.0	110	63-135	
cis-1,3-Dichloropropene	ug/L	<0.069	20	20.5	102	66-129	
Dibromochloromethane	ug/L	<0.048	20	21.9	109	75-133	
Dibromomethane	ug/L	<0.14	20	19.5	98	68-134	
Dichlorodifluoromethane	ug/L	<0.075	20	25.3	126	72-150	
Dichlorofluoromethane	ug/L	<0.054	20	23.5	118	75-129	
Diisopropyl ether	ug/L	<0.050	20	20.8	104	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395459

MATRIX SPIKE SAMPLE: 2639871		10395465001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.062	20	21.0	105	63-132	
Ethylbenzene	ug/L	<0.075	20	20.2	101	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.13	20	20.2	101	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.064	20	22.2	111	70-136	
m&p-Xylene	ug/L	<0.11	40	43.7	109	64-142	
Methyl-tert-butyl ether	ug/L	0.44J	20	20.5	100	72-125	
Methylene Chloride	ug/L	<0.097	20	21.2	106	60-132	
n-Butylbenzene	ug/L	<0.16	20	22.4	112	60-150	
n-Propylbenzene	ug/L	<0.049	20	20.6	103	63-142	
Naphthalene	ug/L	<0.064	20	18.0	90	67-125	
o-Xylene	ug/L	<0.044	20	21.8	109	60-143	
p-Isopropyltoluene	ug/L	<0.064	20	22.2	111	64-146	
sec-Butylbenzene	ug/L	<0.094	20	22.4	112	67-144	
Styrene	ug/L	<0.056	20	21.5	107	67-136	
tert-Amylmethyl ether	ug/L	<0.073	20	20.8	104	60-134	
tert-Butyl Alcohol	ug/L	48.2	200	220	86	56-146	
tert-Butylbenzene	ug/L	<0.051	20	21.3	106	68-135	
Tetrachloroethene	ug/L	<0.13	20	21.5	108	67-148	
Tetrahydrofuran	ug/L	<1.5	200	368	184	51-141 M1	
Toluene	ug/L	<0.059	20	21.0	105	61-140	
trans-1,2-Dichloroethene	ug/L	<0.15	20	21.8	109	62-138	
trans-1,3-Dichloropropene	ug/L	<0.044	20	21.3	107	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	50	42.8	86	30-150	
Trichloroethene	ug/L	<0.044	20	22.0	110	64-149	
Trichlorofluoromethane	ug/L	<0.055	20	25.2	126	75-150	
Vinyl acetate	ug/L	<0.12	20	19.0	95	49-143	
Vinyl chloride	ug/L	<0.098	20	24.4	122	75-133	
Xylene (Total)	ug/L	<0.15	60	65.5	109	63-142	
1,2-Dichloroethane-d4 (S)	%				99	75-137	
4-Bromofluorobenzene (S)	%				99	75-125	
Toluene-d8 (S)	%				98	75-125	

SAMPLE DUPLICATE: 2639872

Parameter	Units	10395465004	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.064	<0.064		30	
1,1,1-Trichloroethane	ug/L	<0.057	<0.057		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.055	<0.055		30	
1,1,2-Trichloroethane	ug/L	<0.064	<0.064		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.13	<0.13		30	
1,1-Dichloroethane	ug/L	<0.055	<0.055		30	
1,1-Dichloroethene	ug/L	<0.069	<0.069		30	
1,1-Dichloropropene	ug/L	<0.082	<0.082		30	
1,2,3-Trichlorobenzene	ug/L	<0.17	<0.17		30	
1,2,3-Trichloropropane	ug/L	<0.19	<0.19		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

SAMPLE DUPLICATE: 2639872

Parameter	Units	10395465004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,4-Trimethylbenzene	ug/L	<0.068	<0.068		30	
1,2-Dibromo-3-chloropropane	ug/L	<0.60	<0.60		30	
1,2-Dibromoethane (EDB)	ug/L	<0.092	<0.092		30	
1,2-Dichlorobenzene	ug/L	<0.078	<0.078		30	
1,2-Dichloroethane	ug/L	<0.072	<0.072		30	
1,2-Dichloroethene (Total)	ug/L	<0.16	<0.16		30	
1,2-Dichloropropane	ug/L	<0.066	<0.066		30	
1,3,5-Trimethylbenzene	ug/L	<0.042	<0.042		30	
1,3-Dichlorobenzene	ug/L	<0.085	<0.085		30	
1,3-Dichloropropane	ug/L	<0.059	<0.059		30	
1,4-Dichlorobenzene	ug/L	<0.081	<0.081		30	
1,4-Dioxane (p-Dioxane)	ug/L	<4.8	<4.8		30	
2,2,4-Trimethylpentane	ug/L	<0.087	<0.087		30	
2,2-Dichloropropane	ug/L	<0.096	<0.096		30	
2-Butanone (MEK)	ug/L	<1.1	<1.1		30	
2-Chlorotoluene	ug/L	<0.084	<0.084		30	
2-Hexanone	ug/L	<0.19	<0.19		30	
4-Chlorotoluene	ug/L	<0.048	<0.048		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.80	<0.80		30	
Acetone	ug/L	<0.64	<0.64		30	
Acrolein	ug/L	<2.1	<2.1		30	
Acrylonitrile	ug/L	<0.49	<0.49		30	
Benzene	ug/L	<0.042	<0.042		30	
Bromobenzene	ug/L	<0.087	<0.087		30	
Bromochloromethane	ug/L	<0.082	<0.082		30	
Bromodichloromethane	ug/L	<0.068	<0.068		30	
Bromoform	ug/L	<0.11	<0.11		30	
Bromomethane	ug/L	<0.20	<0.20		30	
Carbon disulfide	ug/L	0.79J	0.66J		30	
Carbon tetrachloride	ug/L	146	145	1	30	
Chlorobenzene	ug/L	<0.066	<0.066		30	
Chloroethane	ug/L	<0.12	<0.12		30	
Chloroform	ug/L	9.0	9.3	4	30	
Chloromethane	ug/L	<0.080	<0.080		30	
cis-1,2-Dichloroethene	ug/L	<0.12	<0.12		30	
cis-1,3-Dichloropropene	ug/L	<0.069	<0.069		30	
Dibromochloromethane	ug/L	<0.048	<0.048		30	
Dibromomethane	ug/L	<0.14	<0.14		30	
Dichlorodifluoromethane	ug/L	<0.075	<0.075		30	
Dichlorofluoromethane	ug/L	<0.054	<0.054		30	
Diisopropyl ether	ug/L	<0.050	<0.050		30	
Ethyl-tert-butyl ether	ug/L	<0.062	<0.062		30	
Ethylbenzene	ug/L	<0.075	<0.075		30	
Hexachloro-1,3-butadiene	ug/L	<0.13	<0.13		30	
Isopropylbenzene (Cumene)	ug/L	<0.064	<0.064		30	
m&p-Xylene	ug/L	<0.11	<0.11		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

SAMPLE DUPLICATE: 2639872

Parameter	Units	10395465004 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.047	<0.047		30	
Methylene Chloride	ug/L	<0.097	<0.097		30	
n-Butylbenzene	ug/L	<0.16	<0.16		30	
n-Propylbenzene	ug/L	<0.049	<0.049		30	
Naphthalene	ug/L	<0.064	<0.064		30	
o-Xylene	ug/L	<0.044	<0.044		30	
p-Isopropyltoluene	ug/L	<0.064	<0.064		30	
sec-Butylbenzene	ug/L	<0.094	<0.094		30	
Styrene	ug/L	<0.056	<0.056		30	
tert-Amylmethyl ether	ug/L	<0.073	<0.073		30	
tert-Butyl Alcohol	ug/L	<0.89	<0.89		30	
tert-Butylbenzene	ug/L	<0.051	<0.051		30	
Tetrachloroethene	ug/L	<0.13	<0.13		30	
Tetrahydrofuran	ug/L	<1.5	<1.5		30	
Toluene	ug/L	<0.059	<0.059		30	
trans-1,2-Dichloroethene	ug/L	<0.15	<0.15		30	
trans-1,3-Dichloropropene	ug/L	<0.044	<0.044		30	
trans-1,4-Dichloro-2-butene	ug/L	<0.45	<0.45		30	
Trichloroethene	ug/L	<0.044	<0.044		30	
Trichlorofluoromethane	ug/L	<0.055	<0.055		30	
Vinyl acetate	ug/L	<0.12	<0.12		30	
Vinyl chloride	ug/L	<0.098	<0.098		30	
Xylene (Total)	ug/L	<0.15	<0.15		30	
1,2-Dichloroethane-d4 (S)	%	107	110	3		
4-Bromofluorobenzene (S)	%	101	103	2		
Toluene-d8 (S)	%	99	99	0		

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 484882

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395459

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10395459001	MW21D-GW-071117	EPA 8260B	484882		
10395459002	TB-071117	EPA 8260B	484882		

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## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10395459

Page: 1 of 1

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:
Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Gary Honeyman
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus	Company Name: UPRR
Email: mark.Ochsner@ch2m.com	Purchase Order #:	Address:
Phone: <input type="checkbox"/> Fax	Project Name: UPRR_Freeman	Pace Quote: Contract# 758938
Requested Due Date/Circle 24 Hour / 5 Day / 10 Day	Project #: 1497	Pace Project Manager: Jennifer Gross
		Pace Profile #: 36447

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (C=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	Preservatives										Analytes Test Y/N VOCs by 8260 Low Level Dry Weight	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)		
				START		END			# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2SO3	Methanol	Other						
				DATE	TIME	DATE	TIME																
1	MW21D-GW-071117	WTG		07/11/17	1410	3				X													Low level VOCs 001
2	T.B-071117	WT		7/11/17	0700	2				X													Trip Blank 002
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Low Level VOCs	JKB/CH2M	7/12/17	1352	<i>[Signature]</i> PACE	7/12/17	0920 25	Y Y Y

<b>SAMPLER NAME AND SIGNATURE</b>		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples intact (Y/N)
PRINT Name of SAMPLER:	LK Bouman				
SIGNATURE of SAMPLER:	<i>[Signature]</i>				
	DATE Signed:	7-12-17			

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M HILL

Project #:

**WO#: 10395459**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7367 53260611

optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermometer  151401163  
Used:  151401164

Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 2.5      Cooler Temp Corrected (°C): 2.5      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: TRUE      Date and Initials of Person Examining Contents: ME 7-13-17

**USDA Regulated Soil** (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH      Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____      Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>3/3 V99H MN21D-GW-07117</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>2 Trip Blanks</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>040317-3DBB</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1050</u>	Temp: <u>2.5</u>	Corrected Temp: <u>2.5</u>
Time: _____	put in cooler	
Time: <u>1058</u>	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: 07/13/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

July 26, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

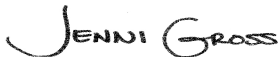
RE: Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia WW Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

California Certification #2973

Montana Certificate #CERT0103

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842015-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):  
E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10395460001	MW21D-GW-071117	Water	07/11/17 14:10	07/13/17 09:20

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10395460001	MW21D-GW-071117	RSK 175	MJL	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	TMS	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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## SUMMARY OF DETECTION

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10395460001</b>	<b>MW21D-GW-071117</b>					
RSK 175	Methane	2.2J	ug/L	10.0	07/13/17 14:06	
6010C Met	Barium, Dissolved	67.3	ug/L	10.0	07/19/17 04:21	
6010C Met	Calcium, Dissolved	22200	ug/L	500	07/19/17 04:21	
6010C Met	Magnesium, Dissolved	19500	ug/L	500	07/19/17 04:21	
6010C Met	Manganese, Dissolved	52.8	ug/L	5.0	07/19/17 04:21	
6010C Met	Potassium, Dissolved	4370	ug/L	2500	07/19/17 04:21	
6010C Met	Sodium, Dissolved	31000	ug/L	1000	07/19/17 04:21	
6010C Met	Vanadium, Dissolved	3.5J	ug/L	15.0	07/19/17 04:21	
6010C Met	Zinc, Dissolved	2.3J	ug/L	20.0	07/19/17 04:21	
SM 2320B	Alkalinity, Total as CaCO3	183	mg/L	5.0	07/15/17 09:43	
SM 2540C	Total Dissolved Solids	254	mg/L	10.0	07/17/17 13:32	
SM 4500-S-2 D	Sulfide, Total	0.0058J	mg/L	0.020	07/18/17 15:53	
EPA 300.0	Chloride	4.3	mg/L	1.2	07/13/17 12:07	
EPA 300.0	Nitrate as N	0.092J	mg/L	0.10	07/13/17 12:07	
EPA 300.0	Sulfate	15.7	mg/L	1.2	07/13/17 12:07	
EPA 353.2	Nitrogen, NO2 plus NO3	0.12	mg/L	0.020	07/13/17 17:11	
EPA 410.4	Chemical Oxygen Demand	17.4J	mg/L	50.0	07/24/17 16:07	
SM 5310C	Total Organic Carbon	2.2	mg/L	1.0	07/15/17 08:03	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 485237

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10395524002,10395595004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2642011)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2642012)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 485434

D8: The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.

- DUP (Lab ID: 2643185)
- Total Dissolved Solids

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 84804

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2057788001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 361454)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484820

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10395137002,10395368001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2639638)
  - Sulfate
- MSD (Lab ID: 2639639)
  - Sulfate

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 484965

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10395178001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2640434)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2640435)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** July 26, 2017

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

**Sample:** MW21D-GW-071117      **Lab ID:** 10395460001      Collected: 07/11/17 14:10      Received: 07/13/17 09:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		07/13/17 14:06	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		07/13/17 14:06	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		07/13/17 14:06	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	07/17/17 12:01	07/19/17 04:21	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	07/17/17 12:01	07/19/17 04:21	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	07/17/17 12:01	07/19/17 04:21	7440-38-2	
Barium, Dissolved	67.3	ug/L	10.0	0.22	1	07/17/17 12:01	07/19/17 04:21	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	07/17/17 12:01	07/19/17 04:21	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	07/17/17 12:01	07/19/17 04:21	7440-43-9	
Calcium, Dissolved	22200	ug/L	500	24.7	1	07/17/17 12:01	07/19/17 04:21	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	07/17/17 12:01	07/19/17 04:21	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	07/17/17 12:01	07/19/17 04:21	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	07/17/17 12:01	07/19/17 04:21	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	07/17/17 12:01	07/19/17 04:21	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	07/17/17 12:01	07/19/17 04:21	7439-92-1	
Magnesium, Dissolved	19500	ug/L	500	2.6	1	07/17/17 12:01	07/19/17 04:21	7439-95-4	
Manganese, Dissolved	52.8	ug/L	5.0	0.38	1	07/17/17 12:01	07/19/17 04:21	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	07/17/17 12:01	07/19/17 04:21	7440-02-0	
Potassium, Dissolved	4370	ug/L	2500	126	1	07/17/17 12:01	07/19/17 04:21	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	07/17/17 12:01	07/19/17 04:21	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	07/17/17 12:01	07/19/17 04:21	7440-22-4	
Sodium, Dissolved	31000	ug/L	1000	44.6	1	07/17/17 12:01	07/19/17 04:21	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	07/17/17 12:01	07/19/17 04:21	7440-28-0	
Vanadium, Dissolved	3.5J	ug/L	15.0	0.42	1	07/17/17 12:01	07/19/17 04:21	7440-62-2	
Zinc, Dissolved	2.3J	ug/L	20.0	1.8	1	07/17/17 12:01	07/19/17 04:21	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	07/18/17 08:34	07/23/17 18:12	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	183	mg/L	5.0	1.4	1		07/15/17 09:43		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	254	mg/L	10.0	5.0	1		07/17/17 13:32		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0058J	mg/L	0.020	0.0050	1		07/18/17 15:53	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	4.3	mg/L	1.2	0.10	1		07/13/17 12:07	16887-00-6	
Nitrate as N	0.092J	mg/L	0.10	0.013	1		07/13/17 12:07	14797-55-8	
Sulfate	15.7	mg/L	1.2	0.16	1		07/13/17 12:07	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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**Sample:** MW21D-GW-071117      **Lab ID:** 10395460001      Collected: 07/11/17 14:10      Received: 07/13/17 09:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.12</b>	mg/L	0.020	0.0075	1		07/13/17 17:11		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>17.4J</b>	mg/L	50.0	15.8	1	07/24/17 09:28	07/24/17 16:07		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>2.2</b>	mg/L	1.0	0.20	1		07/15/17 08:03	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

QC Batch: 484905

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10395460001

METHOD BLANK: 2640035

Matrix: Water

Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	07/13/17 13:37	
Ethene	ug/L	<0.68	10.0	0.68	07/13/17 13:37	
Methane	ug/L	1.7J	10.0	1.1	07/13/17 13:37	

LABORATORY CONTROL SAMPLE & LCSD: 2640036

2640037

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	112	109	99	96	85-115	3	20	
Ethene	ug/L	106	106	102	100	96	85-115	4	20	
Methane	ug/L	60.7	60.2	57.8	99	95	85-115	4	20	

SAMPLE DUPLICATE: 2640038

Parameter	Units	10395116001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.9J	1.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 485055 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10395460001

METHOD BLANK: 2640993 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	07/23/17 18:07	

LABORATORY CONTROL SAMPLE: 2640994

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2640995 2640996

Parameter	Units	10395524014		2640995		2640996		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury, Dissolved	ug/L	ND	5	5	5	4.9	4.8	98	95	80-120	3	20

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 484449 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10395460001

METHOD BLANK: 2638047 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	07/19/17 03:59	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	07/19/17 03:59	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	07/19/17 03:59	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	07/19/17 03:59	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	07/19/17 03:59	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	07/19/17 03:59	
Calcium, Dissolved	ug/L	<24.7	500	24.7	07/19/17 03:59	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	07/19/17 03:59	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	07/19/17 03:59	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	07/19/17 03:59	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	07/19/17 03:59	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	07/19/17 03:59	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	07/19/17 03:59	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	07/19/17 03:59	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	07/19/17 03:59	
Potassium, Dissolved	ug/L	<126	2500	126	07/19/17 03:59	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	07/19/17 03:59	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	07/19/17 03:59	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	07/19/17 03:59	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	07/19/17 03:59	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	07/19/17 03:59	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	07/19/17 03:59	

LABORATORY CONTROL SAMPLE: 2638048

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	104	80-120	
Antimony, Dissolved	ug/L	1000	1010	101	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1010	101	80-120	
Beryllium, Dissolved	ug/L	1000	1020	102	80-120	
Cadmium, Dissolved	ug/L	1000	1010	101	80-120	
Calcium, Dissolved	ug/L	20000	19700	99	80-120	
Chromium, Dissolved	ug/L	1000	996	100	80-120	
Cobalt, Dissolved	ug/L	1000	999	100	80-120	
Copper, Dissolved	ug/L	1000	989	99	80-120	
Iron, Dissolved	ug/L	20000	20000	100	80-120	
Lead, Dissolved	ug/L	1000	1020	102	80-120	
Magnesium, Dissolved	ug/L	20000	20300	101	80-120	
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

LABORATORY CONTROL SAMPLE: 2638048

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1010	101	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1060	106	80-120	
Silver, Dissolved	ug/L	500	498	100	80-120	
Sodium, Dissolved	ug/L	20000	19900	99	80-120	
Thallium, Dissolved	ug/L	1000	1000	100	80-120	
Vanadium, Dissolved	ug/L	1000	979	98	80-120	
Zinc, Dissolved	ug/L	1000	1020	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2638049 2638050

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10395116001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum, Dissolved	ug/L	<8.6	20000	20000	20800	21100	104	105	75-125	1	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	1020	1040	102	104	75-125	2	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	1020	1030	102	103	75-125	1	20	
Barium, Dissolved	ug/L	11.0	1000	1000	1020	1030	101	102	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	1030	1040	103	104	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	1010	1020	101	102	75-125	1	20	
Calcium, Dissolved	ug/L	38700	20000	20000	59300	59000	103	101	75-125	1	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	993	1000	99	100	75-125	1	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	980	991	98	99	75-125	1	20	
Copper, Dissolved	ug/L	<0.83	1000	1000	998	1010	100	101	75-125	1	20	
Iron, Dissolved	ug/L	<16.7	20000	20000	20100	20300	100	101	75-125	1	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	1010	1020	101	102	75-125	1	20	
Magnesium, Dissolved	ug/L	14800	20000	20000	35200	35300	102	103	75-125	0	20	
Manganese, Dissolved	ug/L	3.4J	1000	1000	1000	1010	100	101	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	987	996	99	100	75-125	1	20	
Potassium, Dissolved	ug/L	2780	20000	20000	23500	23600	103	104	75-125	1	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1050	1060	105	106	75-125	1	20	
Silver, Dissolved	ug/L	<0.27	500	500	502	507	100	101	75-125	1	20	
Sodium, Dissolved	ug/L	16000	20000	20000	36300	36200	102	101	75-125	0	20	
Thallium, Dissolved	ug/L	<4.8	1000	1000	984	996	98	99	75-125	1	20	
Vanadium, Dissolved	ug/L	10.2J	1000	1000	997	1010	99	100	75-125	1	20	
Zinc, Dissolved	ug/L	<1.8	1000	1000	1010	1010	100	101	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 485237 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10395460001

METHOD BLANK: 2642006 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	07/15/17 09:07	

LABORATORY CONTROL SAMPLE & LCSD: 2642007 2642008

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	42.2	42.5	106	106	90-110	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642009 2642010

Parameter	Units	10395595004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	176	40	40	220	216	111	101	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642011 2642012

Parameter	Units	10395524002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	668	40	40	721	720	133	131	80-120	0	30	M1

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 485434 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10395460001

METHOD BLANK: 2643183 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	07/17/17 13:32	

LABORATORY CONTROL SAMPLE: 2643184

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	956	96	80-120	

SAMPLE DUPLICATE: 2643185

Parameter	Units	10395245006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	10.0	7.0J		10	D8

SAMPLE DUPLICATE: 2643186

Parameter	Units	10395595004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	232	234	1	10	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 84804 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10395460001

METHOD BLANK: 361451 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	07/18/17 15:52	

LABORATORY CONTROL SAMPLE: 361452

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	107	90-110	

MATRIX SPIKE SAMPLE: 361454

Parameter	Units	2057788001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.012J	6	75-125	M1

SAMPLE DUPLICATE: 361453

Parameter	Units	2057788001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 484820 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10395460001

METHOD BLANK: 2639634 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.10	1.2	0.10	07/13/17 11:13	
Nitrate as N	mg/L	<0.013	0.10	0.013	07/13/17 11:13	
Sulfate	mg/L	<0.16	1.2	0.16	07/13/17 11:13	

LABORATORY CONTROL SAMPLE: 2639635

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.6	101	90-110	
Nitrate as N	mg/L	1	0.97	97	90-110	
Sulfate	mg/L	12.5	12.9	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2639636 2639637

Parameter	Units	10395137002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	<0.10	12.5	12.5	12.6	12.6	101	101	90-110	0	20		
Nitrate as N	mg/L	<0.013	1	1	0.97	0.97	97	97	90-110	0	20		
Sulfate	mg/L	0.37J	12.5	12.5	12.4	12.1	96	94	90-110	3	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2639638 2639639

Parameter	Units	10395368001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	3.2	12.5	12.5	15.4	15.4	97	97	90-110	0	20		
Nitrate as N	mg/L	0.10	1	1	1.1	1.1	95	95	90-110	0	20		
Sulfate	mg/L	27.9	12.5	12.5	37.1	36.3	73	67	90-110	2	20 M1		

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**QUALITY CONTROL DATA**

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

QC Batch: 484965

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10395460001

METHOD BLANK: 2640432

Matrix: Water

Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	07/13/17 17:13	

LABORATORY CONTROL SAMPLE: 2640433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2640434 2640435

Parameter	Units	10395178001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	0.20	1	1	1	1.0	1.0	83	84	90-110	1	20	M1		

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 486820 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10395460001

METHOD BLANK: 2650140 Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	07/24/17 16:06	

LABORATORY CONTROL SAMPLE: 2650141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	307	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2650142 2650143

Parameter	Units	10395020001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chemical Oxygen Demand	mg/L	ND	250	250	276	289	102	107	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2650144 2650145

Parameter	Units	10395116001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chemical Oxygen Demand	mg/L	<15.8	250	250	261	259	103	102	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 UPRR\_Freeman  
Pace Project No.: 10395460

QC Batch: 119420      Analysis Method: SM 5310C  
QC Batch Method: SM 5310C      Analysis Description: 5310C TOC  
Associated Lab Samples: 10395460001

METHOD BLANK: 473132      Matrix: Water  
Associated Lab Samples: 10395460001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	07/15/17 04:56	

LABORATORY CONTROL SAMPLE: 473133

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	26.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 473134      473135

Parameter	Units	10395145005		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	4.0	25	25	31.1	30.9	108	108	80-120	1	20				

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## QUALIFIERS

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

D8 The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 UPRR\_Freeman

Pace Project No.: 10395460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10395460001	MW21D-GW-071117	RSK 175	484905		
10395460001	MW21D-GW-071117	EPA 3010	484449	6010C Met	485635
10395460001	MW21D-GW-071117	EPA 7470A	485055	EPA 7470A	485761
10395460001	MW21D-GW-071117	SM 2320B	485237		
10395460001	MW21D-GW-071117	SM 2540C	485434		
10395460001	MW21D-GW-071117	SM 4500-S-2 D	84804		
10395460001	MW21D-GW-071117	EPA 300.0	484820		
10395460001	MW21D-GW-071117	EPA 353.2	484965		
10395460001	MW21D-GW-071117	EPA 410.4	486820	EPA 410.4	486977
10395460001	MW21D-GW-071117	SM 5310C	119420		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10395460

Page: 1 Of 1

### Section A

#### Required Client Information:

Company: **CH2M Hill**  
 Address: **999 W. Riverside Ave, Suite 500**  
**Spokane, WA 99201**  
 Email:  
 Phone:                      Fax:  
 Requested Due Date: **10 Day Standard**

### Section B

#### Required Project Information:

Report To: **Mark Ochsner, Brad Ostapkowicz**  
 Copy To: **Steve Demus, Lindsey Baumann**  
 Copy To: **David Hodson, UPRR-Sysdat@ghd.com**  
 Purchase Order #                      PEDD# **1497**  
 Project Name: **UPRR Freeman**  
 Project #:                                      **1497**

### Section C

#### Invoice Information:

Attention: **Anne Theriault**  
 Company: **UPRR**  
 Address: **1400 W. 52nd Ave, Denver, CO 80221**  
 Pace Quote:                                  Contract# **758938**  
 Pace Project Manager: **Jennifer Gross**  
 Pace Profile #: **36447 / 4**

Regulatory Agency:

State / Location:

WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test Y/N	Requested Analysis/Filtered (Y/N)								Additional Comments		
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals *	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175		COD 410.4	BOD 10360WLL
1	MW21D-GW-071117			WTG		7/6/17	1410		9	4	3	1	1			X	X	X	X	X	X	X	X	X	X	X		001	
2	<del>FB-071117</del> #KB																												
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Short hold analyses are in bold *Field filtered by client	#KB / CH2M	7/12/17	1349	[Signature] PACE	7-13-17	920	2.5	Y	Y	N	
SAMPLER NAME AND SIGNATURE						TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)	
PRINT Name of SAMPLER: LKBaumann											
SIGNATURE of SAMPLER: [Signature]						DATE Signed: 7-12-17					

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: **CH2M Hill**

Project #:

WO#: **10395460**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: **7367 5326 0611**

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer Used:  151401163  151401164 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **2.5** Cooler Temp Corrected (°C): **2.5** Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: **TRUE** Date and Initials of Person Examining Contents: **ME 7-13-17**

USDA Regulated Soil ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	10. <b>40695 Arrived Broken</b>
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, <b>TOC</b> , DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <b>1 1/4 1/5</b>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1050</b>	Temp: <b>2.5</b>	Corrected Temp: <b>2.5</b>
Time: _____	put in cooler	
Time: <b>1058</b>	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_

**JENNI GROSS**

Date: **07/13/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





Sample Condition Upon F

WO#: 2057673

PM: CMM

Due Date: 07/27/17

CLIENT: PASI-MINN

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Proj

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: (Wet) Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 7-14-17

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Chain of Custody

WO#: 1291694

PM: HRZ Due Date: 07/27/17  
CLIENT: PACE MPLS



Workorder: 10395460 Workorder Name: 1497 UPRN Freeman Owner Received Date: 7/13/2017 Results Requested By: 7/27/2017

Report To		Subcontract To				Requested Analysis																				
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				5632354 / 5310 TOC                LAB USE ONLY																				
Preserved Containers																										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix											H2SO4										
1	MW21D-GW-071117	PS	7/11/2017 14:10	10395460001	Water											1										
2																										
3																										
4																										
5																										

Transfers					Comments									
Released By	Date/Time	Received By	Date/Time											
<i>Shirley O'Connell</i> CB	Pace MN 7/13/17 1500	<i>CB</i>	<i>7/13/17 1800</i>											
	<i>7-13-17 2350</i>	<i>Mum</i>	<i>7/14/17 0800</i>											

Cooler Temperature on Receipt *5.9 °C* Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



**Sample Condition Upon Receipt**

Client Name: Pace - Mpls. Project #: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

**WO#: 1291694**  
 PM: HRZ Due Date: 07/27/17  
 CLIENT: PACE MPLS

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 5.6 Cooler Temp Corrected °C: 5.9 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 7-13-17 C13

Comments: MU 7/14/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE  Y  N TEMPERATURE WAIVER ON FILE  Y  N

Project Manager Review:  Date: 7-14-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

August 31, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10401087

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on August 26, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10401087001	EW6U-GW-082517	Water	08/25/17 13:24	08/26/17 09:33
10401087002	EW9U-GW-082517	Water	08/25/17 13:35	08/26/17 09:33
10401087003	Trip Blank	Water	08/25/17 00:00	08/26/17 09:33

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10401087

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10401087001	EW6U-GW-082517	EPA 8260B	DJB	83	PASI-M
10401087002	EW9U-GW-082517	EPA 8260B	DJB	83	PASI-M
10401087003	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10401087001</b>	<b>EW6U-GW-082517</b>					
EPA 8260B	2-Hexanone	2.8J	ug/L	5.0	08/30/17 13:06	
EPA 8260B	Carbon tetrachloride	15.3	ug/L	0.50	08/30/17 13:06	
EPA 8260B	Chloroform	2.2	ug/L	1.0	08/30/17 13:06	
<b>10401087002</b>	<b>EW9U-GW-082517</b>					
EPA 8260B	4-Methyl-2-pentanone (MIBK)	3.7J	ug/L	5.0	08/30/17 13:28	
EPA 8260B	Carbon disulfide	4.3	ug/L	1.0	08/30/17 13:28	
EPA 8260B	Carbon tetrachloride	820	ug/L	5.0	08/31/17 12:10	
EPA 8260B	Chloroform	50.8	ug/L	1.0	08/30/17 13:28	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** August 31, 2017

**General Information:**

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 494106

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Sample: **EW6U-GW-082517** Lab ID: **10401087001** Collected: 08/25/17 13:24 Received: 08/26/17 09:33 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		08/30/17 13:06	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		08/30/17 13:06	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		08/30/17 13:06	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		08/30/17 13:06	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:06	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:06	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		08/30/17 13:06	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:06	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		08/30/17 13:06	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		08/30/17 13:06	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		08/30/17 13:06	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		08/30/17 13:06	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		08/30/17 13:06	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		08/30/17 13:06	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		08/30/17 13:06	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:06	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		08/30/17 13:06	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		08/30/17 13:06	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		08/30/17 13:06	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		08/30/17 13:06	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		08/30/17 13:06	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		08/30/17 13:06	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		08/30/17 13:06	95-49-8	
2-Hexanone	2.8J	ug/L	5.0	2.5	1		08/30/17 13:06	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		08/30/17 13:06	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		08/30/17 13:06	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		08/30/17 13:06	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		08/30/17 13:06	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		08/30/17 13:06	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		08/30/17 13:06	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		08/30/17 13:06	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		08/30/17 13:06	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		08/30/17 13:06	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		08/30/17 13:06	75-15-0	
Carbon tetrachloride	15.3	ug/L	0.50	0.20	1		08/30/17 13:06	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		08/30/17 13:06	75-00-3	
Chloroform	2.2	ug/L	1.0	0.46	1		08/30/17 13:06	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		08/30/17 13:06	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	124-48-1	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Sample: **EW6U-GW-082517** Lab ID: **10401087001** Collected: 08/25/17 13:24 Received: 08/26/17 09:33 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		08/30/17 13:06	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		08/30/17 13:06	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		08/30/17 13:06	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		08/30/17 13:06	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		08/30/17 13:06	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		08/30/17 13:06	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		08/30/17 13:06	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		08/30/17 13:06	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		08/30/17 13:06	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		08/30/17 13:06	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		08/30/17 13:06	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		08/30/17 13:06	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		08/30/17 13:06	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		08/30/17 13:06	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		08/30/17 13:06	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		08/30/17 13:06	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		08/30/17 13:06	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		08/30/17 13:06	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		08/30/17 13:06	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		08/30/17 13:06	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		08/30/17 13:06	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		08/30/17 13:06	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		08/30/17 13:06	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		08/30/17 13:06	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		08/30/17 13:06	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:06	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		08/30/17 13:06	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		08/30/17 13:06	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		08/30/17 13:06	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		08/30/17 13:06	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Sample: **EW9U-GW-082517** Lab ID: **10401087002** Collected: 08/25/17 13:35 Received: 08/26/17 09:33 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		08/30/17 13:28	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		08/30/17 13:28	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		08/30/17 13:28	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		08/30/17 13:28	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:28	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:28	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		08/30/17 13:28	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:28	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		08/30/17 13:28	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		08/30/17 13:28	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		08/30/17 13:28	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		08/30/17 13:28	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		08/30/17 13:28	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		08/30/17 13:28	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		08/30/17 13:28	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		08/30/17 13:28	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		08/30/17 13:28	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		08/30/17 13:28	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		08/30/17 13:28	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		08/30/17 13:28	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		08/30/17 13:28	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		08/30/17 13:28	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		08/30/17 13:28	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		08/30/17 13:28	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	106-43-4	
4-Methyl-2-pentanone (MIBK)	3.7J	ug/L	5.0	0.55	1		08/30/17 13:28	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		08/30/17 13:28	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		08/30/17 13:28	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		08/30/17 13:28	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		08/30/17 13:28	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		08/30/17 13:28	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		08/30/17 13:28	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		08/30/17 13:28	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		08/30/17 13:28	74-83-9	
Carbon disulfide	4.3	ug/L	1.0	0.37	1		08/30/17 13:28	75-15-0	
Carbon tetrachloride	820	ug/L	5.0	2.0	10		08/31/17 12:10	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		08/30/17 13:28	75-00-3	
Chloroform	50.8	ug/L	1.0	0.46	1		08/30/17 13:28	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		08/30/17 13:28	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

**Sample: EW9U-GW-082517**      **Lab ID: 10401087002**      Collected: 08/25/17 13:35      Received: 08/26/17 09:33      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		08/30/17 13:28	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		08/30/17 13:28	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		08/30/17 13:28	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		08/30/17 13:28	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		08/30/17 13:28	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		08/30/17 13:28	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		08/30/17 13:28	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		08/30/17 13:28	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		08/30/17 13:28	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		08/30/17 13:28	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		08/30/17 13:28	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		08/30/17 13:28	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		08/30/17 13:28	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		08/30/17 13:28	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		08/30/17 13:28	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		08/30/17 13:28	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		08/30/17 13:28	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		08/30/17 13:28	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		08/30/17 13:28	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		08/30/17 13:28	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		08/30/17 13:28	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		08/30/17 13:28	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		08/30/17 13:28	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		08/30/17 13:28	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		08/30/17 13:28	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		08/30/17 13:28	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		08/30/17 13:28	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		08/30/17 13:28	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		08/30/17 13:28	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		08/30/17 13:28	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

**Sample: Trip Blank**      **Lab ID: 10401087003**      Collected: 08/25/17 00:00      Received: 08/26/17 09:33      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		08/30/17 12:00	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		08/30/17 12:00	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		08/30/17 12:00	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		08/30/17 12:00	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		08/30/17 12:00	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		08/30/17 12:00	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		08/30/17 12:00	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		08/30/17 12:00	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		08/30/17 12:00	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		08/30/17 12:00	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		08/30/17 12:00	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		08/30/17 12:00	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		08/30/17 12:00	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		08/30/17 12:00	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		08/30/17 12:00	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		08/30/17 12:00	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		08/30/17 12:00	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		08/30/17 12:00	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		08/30/17 12:00	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		08/30/17 12:00	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		08/30/17 12:00	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		08/30/17 12:00	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		08/30/17 12:00	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		08/30/17 12:00	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		08/30/17 12:00	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		08/30/17 12:00	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		08/30/17 12:00	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		08/30/17 12:00	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		08/30/17 12:00	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		08/30/17 12:00	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		08/30/17 12:00	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		08/30/17 12:00	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		08/30/17 12:00	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		08/30/17 12:00	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		08/30/17 12:00	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		08/30/17 12:00	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		08/30/17 12:00	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		08/30/17 12:00	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

**Sample: Trip Blank**      **Lab ID: 10401087003**      Collected: 08/25/17 00:00      Received: 08/26/17 09:33      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		08/30/17 12:00	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		08/30/17 12:00	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		08/30/17 12:00	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		08/30/17 12:00	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		08/30/17 12:00	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		08/30/17 12:00	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		08/30/17 12:00	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		08/30/17 12:00	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		08/30/17 12:00	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		08/30/17 12:00	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		08/30/17 12:00	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		08/30/17 12:00	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		08/30/17 12:00	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		08/30/17 12:00	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		08/30/17 12:00	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		08/30/17 12:00	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		08/30/17 12:00	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		08/30/17 12:00	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		08/30/17 12:00	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		08/30/17 12:00	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		08/30/17 12:00	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		08/30/17 12:00	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		08/30/17 12:00	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		08/30/17 12:00	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		08/30/17 12:00	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		08/30/17 12:00	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		08/30/17 12:00	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		08/30/17 12:00	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		08/30/17 12:00	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		08/30/17 12:00	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

QC Batch: 494106

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10401087001, 10401087002, 10401087003

METHOD BLANK: 2687442

Matrix: Water

Associated Lab Samples: 10401087001, 10401087002, 10401087003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	08/30/17 11:38	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	08/30/17 11:38	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	08/30/17 11:38	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	08/30/17 11:38	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	08/30/17 11:38	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	08/30/17 11:38	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	08/30/17 11:38	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	08/30/17 11:38	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	08/30/17 11:38	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	08/30/17 11:38	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	08/30/17 11:38	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	08/30/17 11:38	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	08/30/17 11:38	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	08/30/17 11:38	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	08/30/17 11:38	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	08/30/17 11:38	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	08/30/17 11:38	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	08/30/17 11:38	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	08/30/17 11:38	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	08/30/17 11:38	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	08/30/17 11:38	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	08/30/17 11:38	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	08/30/17 11:38	
2-Hexanone	ug/L	<2.5	5.0	2.5	08/30/17 11:38	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	08/30/17 11:38	
Acetone	ug/L	<8.8	20.0	8.8	08/30/17 11:38	
Acrolein	ug/L	<4.8	10.0	4.8	08/30/17 11:38	
Acrylonitrile	ug/L	<4.9	10.0	4.9	08/30/17 11:38	
Benzene	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
Bromobenzene	ug/L	<0.16	0.50	0.16	08/30/17 11:38	
Bromochloromethane	ug/L	<0.38	1.0	0.38	08/30/17 11:38	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	08/30/17 11:38	
Bromoform	ug/L	<1.0	4.0	1.0	08/30/17 11:38	
Bromomethane	ug/L	<1.5	4.0	1.5	08/30/17 11:38	
Carbon disulfide	ug/L	<0.37	1.0	0.37	08/30/17 11:38	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	08/30/17 11:38	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

METHOD BLANK: 2687442

Matrix: Water

Associated Lab Samples: 10401087001, 10401087002, 10401087003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
Chloroethane	ug/L	<0.44	1.0	0.44	08/30/17 11:38	
Chloroform	ug/L	<0.46	1.0	0.46	08/30/17 11:38	
Chloromethane	ug/L	<1.1	4.0	1.1	08/30/17 11:38	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	08/30/17 11:38	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	08/30/17 11:38	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
Dibromomethane	ug/L	<0.50	1.0	0.50	08/30/17 11:38	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	08/30/17 11:38	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	08/30/17 11:38	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	08/30/17 11:38	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
Ethylbenzene	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	08/30/17 11:38	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
m&p-Xylene	ug/L	<0.24	1.0	0.24	08/30/17 11:38	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
Methylene Chloride	ug/L	<1.2	4.0	1.2	08/30/17 11:38	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	08/30/17 11:38	
Naphthalene	ug/L	<0.42	1.0	0.42	08/30/17 11:38	
o-Xylene	ug/L	<0.11	0.50	0.11	08/30/17 11:38	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	08/30/17 11:38	
Styrene	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	08/30/17 11:38	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	08/30/17 11:38	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	08/30/17 11:38	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	08/30/17 11:38	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	08/30/17 11:38	
Toluene	ug/L	<0.17	0.50	0.17	08/30/17 11:38	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	08/30/17 11:38	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	08/30/17 11:38	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	08/30/17 11:38	
Trichloroethene	ug/L	<0.18	0.40	0.18	08/30/17 11:38	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	08/30/17 11:38	
Vinyl acetate	ug/L	<1.5	10.0	1.5	08/30/17 11:38	
Vinyl chloride	ug/L	<0.096	0.20	0.096	08/30/17 11:38	
Xylene (Total)	ug/L	<0.24	1.5	0.24	08/30/17 11:38	
1,2-Dichloroethane-d4 (S)	%	105	75-137		08/30/17 11:38	
4-Bromofluorobenzene (S)	%	101	75-125		08/30/17 11:38	
Toluene-d8 (S)	%	101	75-125		08/30/17 11:38	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

LABORATORY CONTROL SAMPLE & LCSD: 2687443		2687444									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.1	18.2	100	91	75-136	10	30		
1,1,1-Trichloroethane	ug/L	20	20.8	20.3	104	102	75-129	2	30		
1,1,2,2-Tetrachloroethane	ug/L	20	21.7	19.9	109	99	71-138	9	30		
1,1,2-Trichloroethane	ug/L	20	21.4	19.4	107	97	75-125	10	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.9	18.3	99	91	69-126	8	30		
1,1-Dichloroethane	ug/L	20	21.1	20.1	106	101	75-125	5	30		
1,1-Dichloroethene	ug/L	20	20.9	20.0	104	100	75-125	4	30		
1,1-Dichloropropene	ug/L	20	21.0	19.6	105	98	75-125	7	30		
1,2,3-Trichlorobenzene	ug/L	20	22.6	21.6	113	108	75-125	5	30		
1,2,3-Trichloropropane	ug/L	20	20.3	18.8	101	94	75-125	8	30		
1,2,4-Trichlorobenzene	ug/L	20	22.2	20.9	111	105	75-125	6	30		
1,2,4-Trimethylbenzene	ug/L	20	20.9	19.1	104	95	75-125	9	30		
1,2-Dibromo-3-chloropropane	ug/L	50	54.2	49.7	108	99	71-130	8	30		
1,2-Dibromoethane (EDB)	ug/L	20	21.3	19.7	107	98	75-125	8	30		
1,2-Dichlorobenzene	ug/L	20	21.8	19.8	109	99	75-125	10	30		
1,2-Dichloroethane	ug/L	20	19.6	18.5	98	93	70-125	5	30		
1,2-Dichloroethene (Total)	ug/L	40	42.2	40.3	106	101	75-125	5	30		
1,2-Dichloropropane	ug/L	20	20.0	18.2	100	91	75-125	9	30		
1,3,5-Trimethylbenzene	ug/L	20	21.0	19.3	105	97	75-125	8	30		
1,3-Dichlorobenzene	ug/L	20	21.1	19.2	106	96	75-125	9	30		
1,3-Dichloropropane	ug/L	20	21.2	19.9	106	100	75-125	6	30		
1,4-Dichlorobenzene	ug/L	20	20.5	19.0	103	95	75-125	8	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	401	384	100	96	64-140	4	30		
2,2,4-Trimethylpentane	ug/L	20	19.8	19.8	99	99	68-125	0	30		
2,2-Dichloropropane	ug/L	20	20.5	20.7	103	104	70-131	1	30		
2-Butanone (MEK)	ug/L	100	101	97.1	101	97	69-125	4	30		
2-Chlorotoluene	ug/L	20	20.2	18.0	101	90	75-125	11	30		
2-Hexanone	ug/L	100	107	98.4	107	98	73-129	9	30		
4-Chlorotoluene	ug/L	20	20.8	18.8	104	94	75-125	10	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	104	96.6	104	97	73-125	7	30		
Acetone	ug/L	100	125	108	125	108	66-126	14	30		
Acrolein	ug/L	200	174	170	87	85	56-150	2	30		
Acrylonitrile	ug/L	200	217	210	109	105	68-129	3	30		
Benzene	ug/L	20	19.7	18.6	98	93	75-125	6	30		
Bromobenzene	ug/L	20	20.7	18.6	103	93	75-125	11	30		
Bromochloromethane	ug/L	20	20.6	20.0	103	100	75-126	3	30		
Bromodichloromethane	ug/L	20	20.0	18.0	100	90	75-133	11	30		
Bromoform	ug/L	20	19.1	18.2	95	91	62-142	4	30		
Bromomethane	ug/L	20	21.4	20.8	107	104	34-143	3	30		
Carbon disulfide	ug/L	20	19.7	18.8	99	94	71-125	5	30		
Carbon tetrachloride	ug/L	20	20.0	19.6	100	98	71-145	2	30		
Chlorobenzene	ug/L	20	20.2	18.4	101	92	75-125	9	30		
Chloroethane	ug/L	20	22.1	20.9	111	105	75-125	5	30		
Chloroform	ug/L	20	19.1	18.5	96	93	75-125	3	30		
Chloromethane	ug/L	20	22.7	21.3	113	106	54-125	6	30		
cis-1,2-Dichloroethene	ug/L	20	21.6	20.4	108	102	75-125	6	30		
cis-1,3-Dichloropropene	ug/L	20	20.0	18.2	100	91	75-125	9	30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

LABORATORY CONTROL SAMPLE & LCSD: 2687443		2687444								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.4	18.8	102	94	74-141	8	30	
Dibromomethane	ug/L	20	20.9	19.2	105	96	75-125	8	30	
Dichlorodifluoromethane	ug/L	20	20.3	19.2	101	96	59-130	5	30	
Dichlorofluoromethane	ug/L	20	20.5	19.8	102	99	75-125	3	30	
Diisopropyl ether	ug/L	20	20.7	19.9	104	100	69-125	4	30	
Ethyl-tert-butyl ether	ug/L	20	21.8	21.2	109	106	73-125	2	30	
Ethylbenzene	ug/L	20	19.6	17.8	98	89	75-125	10	30	
Hexachloro-1,3-butadiene	ug/L	20	21.7	22.7	108	114	75-131	5	30	
Isopropylbenzene (Cumene)	ug/L	20	20.3	18.6	102	93	75-125	9	30	
m&p-Xylene	ug/L	40	40.4	36.7	101	92	75-125	10	30	
Methyl-tert-butyl ether	ug/L	20	21.1	20.6	106	103	75-125	3	30	
Methylene Chloride	ug/L	20	20.5	19.3	102	97	73-125	6	30	
n-Butylbenzene	ug/L	20	22.0	21.1	110	106	75-125	4	30	
n-Propylbenzene	ug/L	20	20.4	18.4	102	92	75-125	10	30	
Naphthalene	ug/L	20	23.4	21.4	117	107	74-125	9	30	
o-Xylene	ug/L	20	20.6	18.4	103	92	75-125	11	30	
p-Isopropyltoluene	ug/L	20	21.4	19.8	107	99	75-125	8	30	
sec-Butylbenzene	ug/L	20	21.4	20.1	107	101	75-125	6	30	
Styrene	ug/L	20	21.2	19.5	106	98	75-125	8	30	
tert-Amylmethyl ether	ug/L	20	20.9	19.7	104	99	71-126	6	30	
tert-Butyl Alcohol	ug/L	200	187	182	94	91	69-131	3	30	
tert-Butylbenzene	ug/L	20	20.4	18.9	102	95	75-125	7	30	
Tetrachloroethene	ug/L	20	20.0	18.1	100	90	75-125	10	30	
Tetrahydrofuran	ug/L	200	253	221	127	111	65-127	14	30	
Toluene	ug/L	20	20.2	18.4	101	92	75-125	9	30	
trans-1,2-Dichloroethene	ug/L	20	20.6	19.9	103	99	75-125	4	30	
trans-1,3-Dichloropropene	ug/L	20	20.9	19.7	105	98	75-125	6	30	
trans-1,4-Dichloro-2-butene	ug/L	50	50.3	46.6	101	93	30-150	8	30	
Trichloroethene	ug/L	20	20.0	18.1	100	91	75-125	10	30	
Trichlorofluoromethane	ug/L	20	20.7	19.8	103	99	71-140	4	30	
Vinyl acetate	ug/L	20	20.2	19.9	101	100	68-137	1	30	
Vinyl chloride	ug/L	20	21.8	20.8	109	104	70-125	5	30	
Xylene (Total)	ug/L	60	61.0	55.2	102	92	75-125	10	30	
1,2-Dichloroethane-d4 (S)	%				104	109	75-137			
4-Bromofluorobenzene (S)	%				98	99	75-125			
Toluene-d8 (S)	%				102	103	75-125			

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 494106

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10401087

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10401087001	EW6U-GW-082517	EPA 8260B	494106		
10401087002	EW9U-GW-082517	EPA 8260B	494106		
10401087003	Trip Blank	EPA 8260B	494106		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10401087

Page: 1 of 1

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: UPRR		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Theriault (atheria@up.com)	
Address: 1400 W. 52nd Ave. Denver, CO 80221		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email: atheria@up.com		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone: _____ Fax: _____		Purchase Order #		Pace Quote: Contract# 758938	
Requested Due Date: 24 Hr / 3 Day / 10 Day		Project Name: Freeman, WA - Cenex Harvest Lease		Pace Project Manager: Jennifer Gross	
		Project #:		Pace Profile #: 36447 / 4	

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMPI)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Requested Analysis Filtered (Y/N)				Y						
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Analyses Test	Low Level VOCs by 8260	6020 Total Iron	6020 Dissolved Iron (Field Filtered)		SM4500P-E Total Phosphorus					
						DATE	TIME	DATE	TIME																				
1	EWGV-GW-082517			WT	G			8/25/17	13:24		3							X											001
2	EW9V-GW-082517			WT	G			8/25/17	13:35		3							X											002
3	Trip Blank			WT				8/25/17			2							X											003
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													


ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Field filtered by client	JT R KCHM	8/25/17	16:00	<del>_____</del>	8/24/17	9:33	36	4	7	7

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Steve Demus				
SIGNATURE of SAMPLER:	JT R	DATE Signed:	8-25-17		

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** UPRR **Project #:** \_\_\_\_\_

**WO# : 10401087**



10401087

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
**Tracking Number:** 72227399054

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ **Temp Blank?**  Yes  No

**Thermometer**  151401163 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun  
**Used:**  151401164

**Cooler Temp Read (°C):** 3.4 **Cooler Temp Corrected (°C):** 3.6 **Biological Tissue Frozen?**  Yes  No  N/A  
**Temp should be above freezing to 6°C** **Correction Factor:** 1.2 **Date and Initials of Person Examining Contents:** 08/28/17

**USDA Regulated Soil?**  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No **Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?**  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>6W9V -GW-082577 2/3 V69M</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): <u>129531</u>	

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?**  Yes  No  
 Person Contacted: Steve Demus Date/Time: 08/28/17 08:43A

Comments/Resolution: Proceed with headspace in vials, 3 day turn requested.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1025</u>	Temp: <u>3.4</u>	Corrected Temp: <u>3.6</u>
Time: <u>1029</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS **Date:** 08/28/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 29, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

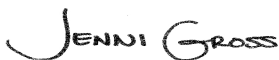
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: UST-078  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: MN00064  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
California Certification #2973  
Montana Certificate #CERT0103  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403555001	Lashow-AG-GW-091217	Water	09/12/17 12:18	09/16/17 08:55
10403555002	Lashow-DOM-GW-091217	Water	09/12/17 11:40	09/16/17 08:55
10403555003	SILVA-GW-091217	Water	09/12/17 13:35	09/16/17 08:55
10403555004	Lang-GW-091217	Water	09/12/17 11:00	09/16/17 08:55
10403555005	STARK-GW-091217	Water	09/12/17 14:54	09/16/17 08:55
10403555006	THORSON-GW-091217	Water	09/12/17 14:20	09/16/17 08:55
10403555007	ASHER-GW-091217	Water	09/12/17 15:20	09/16/17 08:55
10403555008	REED-GW-091317	Water	09/13/17 10:30	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403555001	Lashow-AG-GW-091217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10403555002	Lashow-DOM-GW-091217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10403555003	SILVA-GW-091217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10403555004	Lang-GW-091217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403555005	STARK-GW-091217	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
10403555006	THORSON-GW-091217	SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
10403555007	ASHER-GW-091217	6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
10403555008	REED-GW-091317	SM 2320B	JFP	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10403555001</b>	<b>Lashow-AG-GW-091217</b>					
RSK 175	Methane	14.0	ug/L	10.0	09/19/17 09:39	
6010C Met	Barium, Dissolved	36.9	ug/L	10.0	09/26/17 13:45	
6010C Met	Calcium, Dissolved	33400	ug/L	500	09/26/17 13:45	
6010C Met	Copper, Dissolved	0.85J	ug/L	10.0	09/26/17 13:45	
6010C Met	Iron, Dissolved	180	ug/L	50.0	09/26/17 13:45	
6010C Met	Magnesium, Dissolved	13900	ug/L	500	09/26/17 13:45	
6010C Met	Manganese, Dissolved	36.2	ug/L	5.0	09/26/17 13:45	
6010C Met	Potassium, Dissolved	4890	ug/L	2500	09/26/17 13:45	
6010C Met	Sodium, Dissolved	19000	ug/L	1000	09/26/17 13:45	
6010C Met	Vanadium, Dissolved	2.9J	ug/L	15.0	09/26/17 13:45	
6010C Met	Zinc, Dissolved	487	ug/L	20.0	09/26/17 13:45	
SM 2320B	Alkalinity, Total as CaCO3	176	mg/L	5.0	09/22/17 12:00	
SM 2540C	Total Dissolved Solids	214	mg/L	10.0	09/19/17 15:49	
EPA 300.0	Chloride	2.6	mg/L	1.2	09/16/17 20:11	
EPA 300.0	Sulfate	5.1	mg/L	1.2	09/16/17 20:11	
EPA 410.4	Chemical Oxygen Demand	29.3J	mg/L	50.0	09/20/17 13:45	
SM 5310C	Total Organic Carbon	0.34J	mg/L	1.0	09/20/17 19:03	
<b>10403555002</b>	<b>Lashow-DOM-GW-091217</b>					
RSK 175	Methane	1.3J	ug/L	10.0	09/19/17 09:46	
6010C Met	Barium, Dissolved	10.4	ug/L	10.0	09/26/17 13:47	
6010C Met	Calcium, Dissolved	28300	ug/L	500	09/26/17 13:47	
6010C Met	Copper, Dissolved	3.2J	ug/L	10.0	09/26/17 13:47	
6010C Met	Magnesium, Dissolved	12800	ug/L	500	09/26/17 13:47	
6010C Met	Manganese, Dissolved	2.2J	ug/L	5.0	09/26/17 13:47	
6010C Met	Potassium, Dissolved	4570	ug/L	2500	09/26/17 13:47	
6010C Met	Sodium, Dissolved	17800	ug/L	1000	09/26/17 13:47	
6010C Met	Vanadium, Dissolved	14.3J	ug/L	15.0	09/26/17 13:47	
6010C Met	Zinc, Dissolved	7.3J	ug/L	20.0	09/26/17 13:47	
SM 2320B	Alkalinity, Total as CaCO3	156	mg/L	5.0	09/22/17 12:04	
SM 2540C	Total Dissolved Solids	202	mg/L	10.0	09/19/17 15:49	
EPA 300.0	Chloride	1.5	mg/L	1.2	09/16/17 20:26	
EPA 300.0	Nitrate as N	1.4	mg/L	0.10	09/16/17 20:26	H3
EPA 300.0	Sulfate	4.6	mg/L	1.2	09/16/17 20:26	
EPA 353.2	Nitrogen, NO2 plus NO3	1.2	mg/L	0.020	09/26/17 13:34	
EPA 410.4	Chemical Oxygen Demand	36.2J	mg/L	50.0	09/20/17 13:45	
SM 5310C	Total Organic Carbon	0.61J	mg/L	1.0	09/20/17 19:46	
<b>10403555003</b>	<b>SILVA-GW-091217</b>					
RSK 175	Methane	1.8J	ug/L	10.0	09/19/17 10:12	
6010C Met	Barium, Dissolved	30.1	ug/L	10.0	09/26/17 13:50	
6010C Met	Calcium, Dissolved	40100	ug/L	500	09/26/17 13:50	
6010C Met	Copper, Dissolved	25.2	ug/L	10.0	09/26/17 13:50	
6010C Met	Magnesium, Dissolved	13700	ug/L	500	09/26/17 13:50	
6010C Met	Potassium, Dissolved	1830J	ug/L	2500	09/26/17 13:50	
6010C Met	Sodium, Dissolved	16200	ug/L	1000	09/26/17 13:50	
6010C Met	Vanadium, Dissolved	9.4J	ug/L	15.0	09/26/17 13:50	
6010C Met	Zinc, Dissolved	53.8	ug/L	20.0	09/26/17 13:50	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10403555003</b>	<b>SILVA-GW-091217</b>					
SM 2320B	Alkalinity, Total as CaCO3	169	mg/L	5.0	09/22/17 12:09	
SM 2540C	Total Dissolved Solids	232	mg/L	10.0	09/19/17 15:49	
EPA 300.0	Chloride	2.3	mg/L	1.2	09/16/17 20:41	
EPA 300.0	Nitrate as N	2.2	mg/L	0.10	09/16/17 20:41	H3
EPA 300.0	Sulfate	9.4	mg/L	1.2	09/16/17 20:41	
EPA 353.2	Nitrogen, NO2 plus NO3	2.1	mg/L	0.040	09/26/17 13:35	
EPA 410.4	Chemical Oxygen Demand	24.2J	mg/L	50.0	09/20/17 13:45	
SM 5310C	Total Organic Carbon	0.39J	mg/L	1.0	09/20/17 20:00	
<b>10403555004</b>	<b>Lang-GW-091217</b>					
RSK 175	Methane	2.6J	ug/L	10.0	09/19/17 10:19	
6010C Met	Barium, Dissolved	15.1	ug/L	10.0	09/26/17 13:53	
6010C Met	Calcium, Dissolved	43100	ug/L	500	09/26/17 13:53	
6010C Met	Copper, Dissolved	8.3J	ug/L	10.0	09/26/17 13:53	
6010C Met	Iron, Dissolved	128	ug/L	50.0	09/26/17 13:53	
6010C Met	Magnesium, Dissolved	12900	ug/L	500	09/26/17 13:53	
6010C Met	Manganese, Dissolved	7.3	ug/L	5.0	09/26/17 13:53	
6010C Met	Potassium, Dissolved	1500J	ug/L	2500	09/26/17 13:53	
6010C Met	Sodium, Dissolved	19300	ug/L	1000	09/26/17 13:53	
6010C Met	Vanadium, Dissolved	5.9J	ug/L	15.0	09/26/17 13:53	
6010C Met	Zinc, Dissolved	87.4	ug/L	20.0	09/26/17 13:53	
SM 2320B	Alkalinity, Total as CaCO3	194	mg/L	5.0	09/22/17 12:13	
SM 2540C	Total Dissolved Solids	226	mg/L	10.0	09/19/17 15:49	
EPA 300.0	Chloride	1.7	mg/L	1.2	09/16/17 21:26	
EPA 300.0	Nitrate as N	0.42	mg/L	0.10	09/16/17 21:26	H3
EPA 300.0	Sulfate	2.1	mg/L	1.2	09/16/17 21:26	
EPA 353.2	Nitrogen, NO2 plus NO3	0.45	mg/L	0.020	09/26/17 13:36	
EPA 410.4	Chemical Oxygen Demand	16.6J	mg/L	50.0	09/20/17 13:45	
<b>10403555005</b>	<b>STARK-GW-091217</b>					
RSK 175	Methane	1.2J	ug/L	10.0	09/19/17 10:26	
6010C Met	Barium, Dissolved	32.0	ug/L	10.0	09/26/17 13:56	
6010C Met	Calcium, Dissolved	29800	ug/L	500	09/26/17 13:56	
6010C Met	Cobalt, Dissolved	1.8J	ug/L	10.0	09/26/17 13:56	
6010C Met	Copper, Dissolved	191	ug/L	10.0	09/26/17 13:56	
6010C Met	Magnesium, Dissolved	12800	ug/L	500	09/26/17 13:56	
6010C Met	Manganese, Dissolved	25.3	ug/L	5.0	09/26/17 13:56	
6010C Met	Nickel, Dissolved	9.0J	ug/L	20.0	09/26/17 13:56	
6010C Met	Potassium, Dissolved	3610	ug/L	2500	09/26/17 13:56	
6010C Met	Sodium, Dissolved	17400	ug/L	1000	09/26/17 13:56	
6010C Met	Vanadium, Dissolved	4.0J	ug/L	15.0	09/26/17 13:56	
6010C Met	Zinc, Dissolved	24.0	ug/L	20.0	09/26/17 13:56	
SM 2320B	Alkalinity, Total as CaCO3	141	mg/L	5.0	09/22/17 12:17	
SM 2540C	Total Dissolved Solids	203	mg/L	10.0	09/19/17 15:49	
EPA 300.0	Chloride	1.3	mg/L	1.2	09/16/17 21:41	
EPA 300.0	Nitrate as N	0.78	mg/L	0.10	09/16/17 21:41	H3
EPA 300.0	Sulfate	17.9	mg/L	1.2	09/16/17 21:41	
EPA 353.2	Nitrogen, NO2 plus NO3	0.96	mg/L	0.020	09/26/17 13:37	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10403555005</b>	<b>STARK-GW-091217</b>					
EPA 410.4	Chemical Oxygen Demand	21.7J	mg/L	50.0	09/20/17 13:46	
SM 5310C	Total Organic Carbon	0.24J	mg/L	1.0	09/20/17 20:28	
<b>10403555006</b>	<b>THORSON-GW-091217</b>					
RSK 175	Methane	1.7J	ug/L	10.0	09/19/17 10:33	
6010C Met	Barium, Dissolved	56.4	ug/L	10.0	09/26/17 13:59	
6010C Met	Calcium, Dissolved	24300	ug/L	500	09/26/17 13:59	
6010C Met	Iron, Dissolved	1260	ug/L	50.0	09/26/17 13:59	
6010C Met	Magnesium, Dissolved	12800	ug/L	500	09/26/17 13:59	
6010C Met	Manganese, Dissolved	29.0	ug/L	5.0	09/26/17 13:59	
6010C Met	Potassium, Dissolved	4140	ug/L	2500	09/26/17 13:59	
6010C Met	Sodium, Dissolved	15500	ug/L	1000	09/26/17 13:59	
6010C Met	Zinc, Dissolved	14.3J	ug/L	20.0	09/26/17 13:59	
SM 2320B	Alkalinity, Total as CaCO3	149	mg/L	5.0	09/22/17 12:22	
SM 2540C	Total Dissolved Solids	202	mg/L	10.0	09/19/17 15:49	
SM 4500-S-2 D	Sulfide, Total	0.070	mg/L	0.020	09/19/17 16:56	
EPA 300.0	Chloride	1.2J	mg/L	1.2	09/16/17 21:56	
EPA 300.0	Sulfate	3.0	mg/L	1.2	09/16/17 21:56	
EPA 410.4	Chemical Oxygen Demand	16.2J	mg/L	50.0	09/20/17 13:46	
<b>10403555007</b>	<b>ASHER-GW-091217</b>					
RSK 175	Methane	1.5J	ug/L	10.0	09/19/17 10:41	
6010C Met	Barium, Dissolved	79.9	ug/L	10.0	09/26/17 14:07	
6010C Met	Calcium, Dissolved	59200	ug/L	500	09/26/17 14:07	
6010C Met	Copper, Dissolved	37.4	ug/L	10.0	09/26/17 14:07	
6010C Met	Magnesium, Dissolved	21900	ug/L	500	09/26/17 14:07	
6010C Met	Manganese, Dissolved	0.43J	ug/L	5.0	09/26/17 14:07	
6010C Met	Potassium, Dissolved	2150J	ug/L	2500	09/26/17 14:07	
6010C Met	Sodium, Dissolved	22900	ug/L	1000	09/26/17 14:07	
6010C Met	Vanadium, Dissolved	10J	ug/L	15.0	09/26/17 14:07	
6010C Met	Zinc, Dissolved	10J	ug/L	20.0	09/26/17 14:07	
SM 2320B	Alkalinity, Total as CaCO3	226	mg/L	5.0	09/22/17 13:16	
SM 2540C	Total Dissolved Solids	341	mg/L	10.0	09/19/17 15:49	
EPA 300.0	Chloride	7.2	mg/L	1.2	09/16/17 22:59	
EPA 300.0	Nitrate as N	5.0	mg/L	0.10	09/16/17 22:59	H3
EPA 300.0	Sulfate	26.7	mg/L	1.2	09/16/17 22:59	
EPA 353.2	Nitrogen, NO2 plus NO3	4.4	mg/L	0.10	09/26/17 13:39	
EPA 410.4	Chemical Oxygen Demand	25.1J	mg/L	50.0	09/20/17 13:46	
SM 5310C	Total Organic Carbon	0.74J	mg/L	1.0	09/20/17 20:57	
<b>10403555008</b>	<b>REED-GW-091317</b>					
RSK 175	Methane	1.8J	ug/L	10.0	09/19/17 13:10	
6010C Met	Barium, Dissolved	50.0	ug/L	10.0	09/26/17 14:10	
6010C Met	Calcium, Dissolved	27200	ug/L	500	09/26/17 14:10	
6010C Met	Copper, Dissolved	1.2J	ug/L	10.0	09/26/17 14:10	
6010C Met	Magnesium, Dissolved	11000	ug/L	500	09/26/17 14:10	
6010C Met	Manganese, Dissolved	0.84J	ug/L	5.0	09/26/17 14:10	
6010C Met	Potassium, Dissolved	3380	ug/L	2500	09/26/17 14:10	
6010C Met	Sodium, Dissolved	14500	ug/L	1000	09/26/17 14:10	

### REPORT OF LABORATORY ANALYSIS

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## SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403555008</b>	<b>REED-GW-091317</b>					
6010C Met	Vanadium, Dissolved	22.0	ug/L	15.0	09/26/17 14:10	
6010C Met	Zinc, Dissolved	32.9	ug/L	20.0	09/26/17 14:10	
SM 2320B	Alkalinity, Total as CaCO3	138	mg/L	5.0	09/26/17 10:42	
SM 2540C	Total Dissolved Solids	184	mg/L	10.0	09/19/17 16:47	
EPA 300.0	Chloride	1.3	mg/L	1.2	09/16/17 23:14	
EPA 300.0	Nitrate as N	0.27	mg/L	0.10	09/16/17 23:14	H3
EPA 300.0	Sulfate	5.8	mg/L	1.2	09/16/17 23:14	
EPA 353.2	Nitrogen, NO2 plus NO3	0.29	mg/L	0.020	09/26/17 13:41	
EPA 410.4	Chemical Oxygen Demand	23.3J	mg/L	50.0	09/20/17 13:47	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 497163

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403287001

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 2703625)
  - Sodium, Dissolved
- MSD (Lab ID: 2703626)
  - Sodium, Dissolved

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498358

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403539002,10403539007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2709329)
  - Alkalinity, Total as CaCO<sub>3</sub>

QC Batch: 498840

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403809002,10403938001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2712337)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 497459

D6: The precision between the sample and sample duplicate exceeded laboratory control limits.

- DUP (Lab ID: 2704940)
- Total Dissolved Solids

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 89537

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403555001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 383688)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

### General Information:

8 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H3: Sample was received or analysis requested beyond the recognized method holding time.

- ASHER-GW-091217 (Lab ID: 10403555007)
- Lang-GW-091217 (Lab ID: 10403555004)
- Lashow-AG-GW-091217 (Lab ID: 10403555001)
- Lashow-DOM-GW-091217 (Lab ID: 10403555002)
- REED-GW-091317 (Lab ID: 10403555008)
- SILVA-GW-091217 (Lab ID: 10403555003)
- STARK-GW-091217 (Lab ID: 10403555005)
- THORSON-GW-091217 (Lab ID: 10403555006)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 497081

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403555006,7573730001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2703292)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2703293)
  - Chloride
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

### General Information:

8 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498887

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403783001,10403783002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2712506)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2712507)
  - Nitrogen, NO2 plus NO3

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** September 29, 2017

**General Information:**

8 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

**Sample: Lashow-AG-GW-091217**    **Lab ID: 10403555001**    Collected: 09/12/17 12:18    Received: 09/16/17 08:55    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 09:39	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 09:39	74-85-1	
Methane	14.0	ug/L	10.0	1.1	1		09/19/17 09:39	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 13:45	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 13:45	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 13:45	7440-38-2	
Barium, Dissolved	36.9	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 13:45	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 13:45	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 13:45	7440-43-9	
Calcium, Dissolved	33400	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 13:45	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 13:45	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 13:45	7440-48-4	
Copper, Dissolved	0.85J	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 13:45	7440-50-8	
Iron, Dissolved	180	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 13:45	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 13:45	7439-92-1	
Magnesium, Dissolved	13900	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 13:45	7439-95-4	
Manganese, Dissolved	36.2	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 13:45	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 13:45	7440-02-0	
Potassium, Dissolved	4890	ug/L	2500	126	1	09/21/17 10:04	09/26/17 13:45	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 13:45	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 13:45	7440-22-4	
Sodium, Dissolved	19000	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 13:45	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 13:45	7440-28-0	
Vanadium, Dissolved	2.9J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 13:45	7440-62-2	
Zinc, Dissolved	487	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 13:45	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:09	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	176	mg/L	5.0	1.4	1		09/22/17 12:00		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	214	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:49	18496-25-8	M1
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.6	mg/L	1.2	0.14	1		09/16/17 20:11	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		09/16/17 20:11	14797-55-8	H3
Sulfate	5.1	mg/L	1.2	0.27	1		09/16/17 20:11	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: Lashow-AG-GW-091217**    **Lab ID: 10403555001**    Collected: 09/12/17 12:18    Received: 09/16/17 08:55    Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		09/26/17 13:33		
<b>410.4 COD</b>	Analytical Method: EPA 410.4    Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>29.3J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:45		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.34J</b>	mg/L	1.0	0.20	1		09/20/17 19:03	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10403555

**Sample:** Lashow-DOM-GW-091217    **Lab ID:** 10403555002    Collected: 09/12/17 11:40    Received: 09/16/17 08:55    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 09:46	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 09:46	74-85-1	
Methane	1.3J	ug/L	10.0	1.1	1		09/19/17 09:46	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 13:47	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 13:47	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 13:47	7440-38-2	
Barium, Dissolved	10.4	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 13:47	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 13:47	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 13:47	7440-43-9	
Calcium, Dissolved	28300	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 13:47	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 13:47	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 13:47	7440-48-4	
Copper, Dissolved	3.2J	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 13:47	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 13:47	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 13:47	7439-92-1	
Magnesium, Dissolved	12800	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 13:47	7439-95-4	
Manganese, Dissolved	2.2J	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 13:47	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 13:47	7440-02-0	
Potassium, Dissolved	4570	ug/L	2500	126	1	09/21/17 10:04	09/26/17 13:47	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 13:47	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 13:47	7440-22-4	
Sodium, Dissolved	17800	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 13:47	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 13:47	7440-28-0	
Vanadium, Dissolved	14.3J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 13:47	7440-62-2	
Zinc, Dissolved	7.3J	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 13:47	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:11	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	156	mg/L	5.0	1.4	1		09/22/17 12:04		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	202	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:52	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.5	mg/L	1.2	0.14	1		09/16/17 20:26	16887-00-6	
Nitrate as N	1.4	mg/L	0.10	0.0079	1		09/16/17 20:26	14797-55-8	H3
Sulfate	4.6	mg/L	1.2	0.27	1		09/16/17 20:26	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

**Sample: Lashow-DOM-GW-091217**    **Lab ID: 10403555002**    Collected: 09/12/17 11:40    Received: 09/16/17 08:55    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.2</b>	mg/L	0.020	0.0075	1		09/26/17 13:34		
<b>410.4 COD</b>	Analytical Method: EPA 410.4    Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>36.2J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:45		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.61J</b>	mg/L	1.0	0.20	1		09/20/17 19:46	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

**Sample: SILVA-GW-091217**      **Lab ID: 10403555003**      Collected: 09/12/17 13:35      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 10:12	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 10:12	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		09/19/17 10:12	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 13:50	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 13:50	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 13:50	7440-38-2	
Barium, Dissolved	30.1	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 13:50	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 13:50	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 13:50	7440-43-9	
Calcium, Dissolved	40100	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 13:50	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 13:50	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 13:50	7440-48-4	
Copper, Dissolved	25.2	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 13:50	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 13:50	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 13:50	7439-92-1	
Magnesium, Dissolved	13700	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 13:50	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 13:50	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 13:50	7440-02-0	
Potassium, Dissolved	1830J	ug/L	2500	126	1	09/21/17 10:04	09/26/17 13:50	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 13:50	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 13:50	7440-22-4	
Sodium, Dissolved	16200	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 13:50	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 13:50	7440-28-0	
Vanadium, Dissolved	9.4J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 13:50	7440-62-2	
Zinc, Dissolved	53.8	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 13:50	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:18	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	169	mg/L	5.0	1.4	1		09/22/17 12:09		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	232	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:53	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.3	mg/L	1.2	0.14	1		09/16/17 20:41	16887-00-6	
Nitrate as N	2.2	mg/L	0.10	0.0079	1		09/16/17 20:41	14797-55-8	H3
Sulfate	9.4	mg/L	1.2	0.27	1		09/16/17 20:41	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: SILVA-GW-091217**      **Lab ID: 10403555003**      Collected: 09/12/17 13:35      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>2.1</b>	mg/L	0.040	0.015	2		09/26/17 13:35		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>24.2J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:45		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.39J</b>	mg/L	1.0	0.20	1		09/20/17 20:00	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Page Project No.: 10403555

**Sample: Lang-GW-091217**      **Lab ID: 1040355004**      Collected: 09/12/17 11:00      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 10:19	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 10:19	74-85-1	
Methane	2.6J	ug/L	10.0	1.1	1		09/19/17 10:19	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 13:53	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 13:53	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 13:53	7440-38-2	
Barium, Dissolved	15.1	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 13:53	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 13:53	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 13:53	7440-43-9	
Calcium, Dissolved	43100	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 13:53	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 13:53	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 13:53	7440-48-4	
Copper, Dissolved	8.3J	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 13:53	7440-50-8	
Iron, Dissolved	128	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 13:53	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 13:53	7439-92-1	
Magnesium, Dissolved	12900	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 13:53	7439-95-4	
Manganese, Dissolved	7.3	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 13:53	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 13:53	7440-02-0	
Potassium, Dissolved	1500J	ug/L	2500	126	1	09/21/17 10:04	09/26/17 13:53	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 13:53	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 13:53	7440-22-4	
Sodium, Dissolved	19300	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 13:53	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 13:53	7440-28-0	
Vanadium, Dissolved	5.9J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 13:53	7440-62-2	
Zinc, Dissolved	87.4	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 13:53	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:20	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	194	mg/L	5.0	1.4	1		09/22/17 12:13		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	226	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:54	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.7	mg/L	1.2	0.14	1		09/16/17 21:26	16887-00-6	
Nitrate as N	0.42	mg/L	0.10	0.0079	1		09/16/17 21:26	14797-55-8	H3
Sulfate	2.1	mg/L	1.2	0.27	1		09/16/17 21:26	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: Lang-GW-091217**      **Lab ID: 10403555004**      Collected: 09/12/17 11:00      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.45</b>	mg/L	0.020	0.0075	1		09/26/17 13:36		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>16.6J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:45		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		09/20/17 20:14	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Page Project No.: 10403555

**Sample: STARK-GW-091217**      **Lab ID: 10403555005**      Collected: 09/12/17 14:54      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 10:26	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 10:26	74-85-1	
Methane	1.2J	ug/L	10.0	1.1	1		09/19/17 10:26	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 13:56	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 13:56	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 13:56	7440-38-2	
Barium, Dissolved	32.0	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 13:56	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 13:56	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 13:56	7440-43-9	
Calcium, Dissolved	29800	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 13:56	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 13:56	7440-47-3	
Cobalt, Dissolved	1.8J	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 13:56	7440-48-4	
Copper, Dissolved	191	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 13:56	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 13:56	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 13:56	7439-92-1	
Magnesium, Dissolved	12800	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 13:56	7439-95-4	
Manganese, Dissolved	25.3	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 13:56	7439-96-5	
Nickel, Dissolved	9.0J	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 13:56	7440-02-0	
Potassium, Dissolved	3610	ug/L	2500	126	1	09/21/17 10:04	09/26/17 13:56	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 13:56	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 13:56	7440-22-4	
Sodium, Dissolved	17400	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 13:56	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 13:56	7440-28-0	
Vanadium, Dissolved	4.0J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 13:56	7440-62-2	
Zinc, Dissolved	24.0	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 13:56	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:27	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	141	mg/L	5.0	1.4	1		09/22/17 12:17		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	203	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:55	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.3	mg/L	1.2	0.14	1		09/16/17 21:41	16887-00-6	
Nitrate as N	0.78	mg/L	0.10	0.0079	1		09/16/17 21:41	14797-55-8	H3
Sulfate	17.9	mg/L	1.2	0.27	1		09/16/17 21:41	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: STARK-GW-091217**      **Lab ID: 10403555005**      Collected: 09/12/17 14:54      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.96</b>	mg/L	0.020	0.0075	1		09/26/17 13:37		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>21.7J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:46		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.24J</b>	mg/L	1.0	0.20	1		09/20/17 20:28	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

**Sample:** THORSON-GW-091217    **Lab ID:** 10403555006    Collected: 09/12/17 14:20    Received: 09/16/17 08:55    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 10:33	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 10:33	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		09/19/17 10:33	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met    Preparation Method: EPA 3010							
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 13:59	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 13:59	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 13:59	7440-38-2	
Barium, Dissolved	56.4	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 13:59	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 13:59	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 13:59	7440-43-9	
Calcium, Dissolved	24300	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 13:59	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 13:59	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 13:59	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 13:59	7440-50-8	
Iron, Dissolved	1260	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 13:59	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 13:59	7439-92-1	
Magnesium, Dissolved	12800	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 13:59	7439-95-4	
Manganese, Dissolved	29.0	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 13:59	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 13:59	7440-02-0	
Potassium, Dissolved	4140	ug/L	2500	126	1	09/21/17 10:04	09/26/17 13:59	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 13:59	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 13:59	7440-22-4	
Sodium, Dissolved	15500	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 13:59	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 13:59	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 13:59	7440-62-2	
Zinc, Dissolved	14.3J	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 13:59	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A    Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:29	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	149	mg/L	5.0	1.4	1		09/22/17 12:22		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	202	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	0.070	mg/L	0.020	0.0050	1		09/19/17 16:56	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.2J	mg/L	1.2	0.14	1		09/16/17 21:56	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		09/16/17 21:56	14797-55-8	H3
Sulfate	3.0	mg/L	1.2	0.27	1		09/16/17 21:56	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: THORSON-GW-091217**      **Lab ID: 10403555006**      Collected: 09/12/17 14:20      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		09/26/17 13:38		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>16.2J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:46		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		09/20/17 20:42	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Page Project No.: 10403555

**Sample:** ASHER-GW-091217      **Lab ID:** 1040355007      Collected: 09/12/17 15:20      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 10:41	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 10:41	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		09/19/17 10:41	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 14:07	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 14:07	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 14:07	7440-38-2	
Barium, Dissolved	79.9	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 14:07	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 14:07	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 14:07	7440-43-9	
Calcium, Dissolved	59200	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 14:07	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 14:07	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 14:07	7440-48-4	
Copper, Dissolved	37.4	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 14:07	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 14:07	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 14:07	7439-92-1	
Magnesium, Dissolved	21900	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 14:07	7439-95-4	
Manganese, Dissolved	0.43J	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 14:07	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 14:07	7440-02-0	
Potassium, Dissolved	2150J	ug/L	2500	126	1	09/21/17 10:04	09/26/17 14:07	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 14:07	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 14:07	7440-22-4	
Sodium, Dissolved	22900	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 14:07	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 14:07	7440-28-0	
Vanadium, Dissolved	10J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 14:07	7440-62-2	
Zinc, Dissolved	10J	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 14:07	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:31	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	226	mg/L	5.0	1.4	1		09/22/17 13:16		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	341	mg/L	10.0	5.0	1		09/19/17 15:49		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:58	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.2	mg/L	1.2	0.14	1		09/16/17 22:59	16887-00-6	
Nitrate as N	5.0	mg/L	0.10	0.0079	1		09/16/17 22:59	14797-55-8	H3
Sulfate	26.7	mg/L	1.2	0.27	1		09/16/17 22:59	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: ASHER-GW-091217**      **Lab ID: 10403555007**      Collected: 09/12/17 15:20      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.4</b>	mg/L	0.10	0.037	5		09/26/17 13:39		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>25.1J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:46		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.74J</b>	mg/L	1.0	0.20	1		09/20/17 20:57	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

**Sample: REED-GW-091317**      **Lab ID: 1040355008**      Collected: 09/13/17 10:30      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 13:10	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 13:10	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		09/19/17 13:10	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 14:10	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 14:10	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 14:10	7440-38-2	
Barium, Dissolved	50.0	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 14:10	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 14:10	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 14:10	7440-43-9	
Calcium, Dissolved	27200	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 14:10	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 14:10	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 14:10	7440-48-4	
Copper, Dissolved	1.2J	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 14:10	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 14:10	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 14:10	7439-92-1	
Magnesium, Dissolved	11000	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 14:10	7439-95-4	
Manganese, Dissolved	0.84J	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 14:10	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 14:10	7440-02-0	
Potassium, Dissolved	3380	ug/L	2500	126	1	09/21/17 10:04	09/26/17 14:10	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 14:10	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 14:10	7440-22-4	
Sodium, Dissolved	14500	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 14:10	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 14:10	7440-28-0	
Vanadium, Dissolved	22.0	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 14:10	7440-62-2	
Zinc, Dissolved	32.9	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 14:10	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:34	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	138	mg/L	5.0	1.4	1		09/26/17 10:42		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	184	mg/L	10.0	5.0	1		09/19/17 16:47		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/19/17 16:59	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.3	mg/L	1.2	0.14	1		09/16/17 23:14	16887-00-6	
Nitrate as N	0.27	mg/L	0.10	0.0079	1		09/16/17 23:14	14797-55-8	H3
Sulfate	5.8	mg/L	1.2	0.27	1		09/16/17 23:14	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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**Sample: REED-GW-091317**      **Lab ID: 10403555008**      Collected: 09/13/17 10:30      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.29</b>	mg/L	0.020	0.0075	1		09/26/17 13:41		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>23.3J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:47		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		09/20/17 21:39	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

QC Batch: 497258 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007

METHOD BLANK: 2703959 Matrix: Water  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	09/19/17 08:11	
Ethene	ug/L	<0.68	10.0	0.68	09/19/17 08:11	
Methane	ug/L	1.5J	10.0	1.1	09/19/17 08:11	

LABORATORY CONTROL SAMPLE & LCSD: 2703960

Parameter	Units	2703961							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
Ethane	ug/L	114	103	108	90	95	85-115	4	20	
Ethene	ug/L	106	97.0	101	91	95	85-115	4	20	
Methane	ug/L	60.7	54.1	56.7	89	93	85-115	5	20	

SAMPLE DUPLICATE: 2705247

Parameter	Units	60252993012 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	2.5J		20	

SAMPLE DUPLICATE: 2705248

Parameter	Units	60253033004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	8.6J		20	
Ethene	ug/L	41.6	39.4		5	20
Methane	ug/L	6710	6330		6	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

QC Batch: 497453 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10403555008

METHOD BLANK: 2704915 Matrix: Water  
Associated Lab Samples: 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	09/19/17 11:32	
Ethene	ug/L	<0.68	10.0	0.68	09/19/17 11:32	
Methane	ug/L	1.6J	10.0	1.1	09/19/17 11:32	

LABORATORY CONTROL SAMPLE & LCSD: 2704916

Parameter	Units	2704917								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	108	103	95	90	85-115	4	20	
Ethene	ug/L	106	101	96.3	95	91	85-115	5	20	
Methane	ug/L	60.7	56.7	53.6	93	88	85-115	6	20	

SAMPLE DUPLICATE: 2704918

Parameter	Units	60253123005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	296	282	5	20	

SAMPLE DUPLICATE: 2704919

Parameter	Units	10403686002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	13.9	3.4J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch: 497189

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

METHOD BLANK: 2703727

Matrix: Water

Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	09/26/17 15:04	

LABORATORY CONTROL SAMPLE: 2703728

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703729 2703730

Parameter	Units	10403555002		2703730		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Mercury, Dissolved	ug/L	<0.062	5	5	4.8	4.9	97	97	80-120	1	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

QC Batch: 497163 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

METHOD BLANK: 2703623 Matrix: Water  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	09/26/17 12:59	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	09/26/17 12:59	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	09/26/17 12:59	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	09/26/17 12:59	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	09/26/17 12:59	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	09/26/17 12:59	
Calcium, Dissolved	ug/L	<24.7	500	24.7	09/26/17 12:59	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	09/26/17 12:59	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	09/26/17 12:59	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	09/26/17 12:59	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	09/26/17 12:59	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	09/26/17 12:59	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	09/26/17 12:59	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	09/26/17 12:59	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	09/26/17 12:59	
Potassium, Dissolved	ug/L	<126	2500	126	09/26/17 12:59	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	09/26/17 12:59	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	09/26/17 12:59	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	09/26/17 12:59	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	09/26/17 12:59	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	09/26/17 12:59	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	09/26/17 12:59	

LABORATORY CONTROL SAMPLE: 2703624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21500	108	80-120	
Antimony, Dissolved	ug/L	1000	1050	105	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1050	105	80-120	
Beryllium, Dissolved	ug/L	1000	1030	103	80-120	
Cadmium, Dissolved	ug/L	1000	1020	102	80-120	
Calcium, Dissolved	ug/L	20000	19800	99	80-120	
Chromium, Dissolved	ug/L	1000	1020	102	80-120	
Cobalt, Dissolved	ug/L	1000	1020	102	80-120	
Copper, Dissolved	ug/L	1000	1030	103	80-120	
Iron, Dissolved	ug/L	20000	20300	102	80-120	
Lead, Dissolved	ug/L	1000	1040	104	80-120	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

LABORATORY CONTROL SAMPLE: 2703624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Magnesium, Dissolved	ug/L	20000	20600	103	80-120	
Manganese, Dissolved	ug/L	1000	1040	104	80-120	
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20700	104	80-120	
Selenium, Dissolved	ug/L	1000	1080	108	80-120	
Silver, Dissolved	ug/L	500	506	101	80-120	
Sodium, Dissolved	ug/L	20000	20800	104	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	996	100	80-120	
Zinc, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703625 2703626

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10403287001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum, Dissolved	ug/L	ND	20000	20000	22600	22600	113	113	75-125	0	20	
Antimony, Dissolved	ug/L	ND	1000	1000	1110	1120	111	112	75-125	1	20	
Arsenic, Dissolved	ug/L	ND	1000	1000	1080	1090	108	109	75-125	1	20	
Barium, Dissolved	ug/L	21.7	1000	1000	1040	1030	102	101	75-125	1	20	
Beryllium, Dissolved	ug/L	ND	1000	1000	1070	1070	107	107	75-125	0	20	
Cadmium, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	75-125	0	20	
Calcium, Dissolved	ug/L	168000	20000	20000	188000	185000	96	83	75-125	1	20	
Chromium, Dissolved	ug/L	ND	1000	1000	994	994	99	99	75-125	0	20	
Cobalt, Dissolved	ug/L	ND	1000	1000	978	976	98	97	75-125	0	20	
Copper, Dissolved	ug/L	ND	1000	1000	1090	1070	108	107	75-125	1	20	
Iron, Dissolved	ug/L	ND	20000	20000	19900	19900	99	99	75-125	0	20	
Lead, Dissolved	ug/L	ND	1000	1000	975	974	98	97	75-125	0	20	
Magnesium, Dissolved	ug/L	173000	20000	20000	192000	190000	98	88	75-125	1	20	
Manganese, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	75-125	0	20	
Nickel, Dissolved	ug/L	ND	1000	1000	963	963	96	96	75-125	0	20	
Potassium, Dissolved	ug/L	14900	20000	20000	39100	39000	121	120	75-125	0	20	
Selenium, Dissolved	ug/L	190	1000	1000	1340	1350	114	116	75-125	1	20	
Silver, Dissolved	ug/L	ND	500	500	530	523	106	105	75-125	1	20	
Sodium, Dissolved	ug/L	417000	20000	20000	430000	428000	68	58	75-125	0	20	P6
Thallium, Dissolved	ug/L	ND	1000	1000	910	908	90	90	75-125	0	20	
Vanadium, Dissolved	ug/L	ND	1000	1000	1010	997	101	100	75-125	1	20	
Zinc, Dissolved	ug/L	ND	1000	1000	952	951	94	94	75-125	0	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

QC Batch: 498358 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007

METHOD BLANK: 2709325 Matrix: Water  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	09/22/17 11:41	

LABORATORY CONTROL SAMPLE & LCSD: 2709326 2709327

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	38.4	40.8	96	102	90-110	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2709328 2709329

Parameter	Units	10403539002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	333	40	40	380	383	115	124	80-120	1	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2709330 2709331

Parameter	Units	10403539007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	216	40	40	258	259	104	107	80-120	0	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch: 498840

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10403555008

METHOD BLANK: 2712334

Matrix: Water

Associated Lab Samples: 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	09/26/17 10:27	

LABORATORY CONTROL SAMPLE & LCSD: 2712335

2712336

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	39.4	41.4	99	104	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712337

2712338

Parameter	Units	10403938001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	189	40	40	263	224	184	87	80-120	16	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712339

2712340

Parameter	Units	10403809002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	82.4	40	40	120	116	93	84	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch: 497458

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007

METHOD BLANK: 2704934

Matrix: Water

Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	09/19/17 15:49	

LABORATORY CONTROL SAMPLE: 2704935

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	910	91	80-120	

SAMPLE DUPLICATE: 2704936

Parameter	Units	10403555001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	214	228	6	10	

SAMPLE DUPLICATE: 2704937

Parameter	Units	10403555002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	202	190	6	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch: 497459

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10403555008

METHOD BLANK: 2704938

Matrix: Water

Associated Lab Samples: 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	09/19/17 16:47	

LABORATORY CONTROL SAMPLE: 2704939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	960	96	80-120	

SAMPLE DUPLICATE: 2704940

Parameter	Units	10403344002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	190	228	18	10	D6

SAMPLE DUPLICATE: 2704941

Parameter	Units	10403344003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	323	320	1	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch: 89537

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

METHOD BLANK: 383685

Matrix: Water

Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	09/19/17 16:46	

LABORATORY CONTROL SAMPLE: 383686

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 383688

Parameter	Units	10403555001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.13	64	75-125	M1

SAMPLE DUPLICATE: 383687

Parameter	Units	10403555001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403555

QC Batch: 497081 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

METHOD BLANK: 2703290 Matrix: Water  
Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	09/19/17 19:08	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	09/19/17 19:08	
Sulfate	mg/L	<0.27	1.2	0.27	09/19/17 19:08	

LABORATORY CONTROL SAMPLE: 2703291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.0	104	90-110	
Nitrate as N	mg/L	1	1.0	101	90-110	
Sulfate	mg/L	12.5	12.8	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703292 2703293

Parameter	Units	7573730001		2703293		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	20.9	12.5	12.5	30.4	30.3	76	76	90-110	0	20 M1
Nitrate as N	mg/L	ND	1	1	0.96	0.96	92	91	90-110	0	20
Sulfate	mg/L	12.3	12.5	12.5	22.8	22.8	84	84	90-110	0	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703370 2703371

Parameter	Units	10403555006		2703371		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	1.2J	12.5	12.5	13.2	13.2	96	96	90-110	0	20
Nitrate as N	mg/L	<0.0079	1	1	0.95	0.94	95	94	90-110	0	20
Sulfate	mg/L	3.0	12.5	12.5	14.5	14.5	92	92	90-110	0	20

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch: 498887 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

METHOD BLANK: 2712502 Matrix: Water  
 Associated Lab Samples: 10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	09/26/17 13:51	FS

LABORATORY CONTROL SAMPLE: 2712503

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712504 2712505

Parameter	Units	10403783001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	1.0	0.96	101	96	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712506 2712507

Parameter	Units	10403783002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.091	0.091	9	8	90-110	1	20	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch:	497695	Analysis Method:	EPA 410.4
QC Batch Method:	EPA 410.4	Analysis Description:	410.4 COD
Associated Lab Samples:	10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008		

METHOD BLANK:	2706312	Matrix:	Water
Associated Lab Samples:	10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	09/20/17 13:41	

LABORATORY CONTROL SAMPLE: 2706313						
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	298	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2706314												2706315	
Parameter	Units	10403092001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Chemical Oxygen Demand	mg/L	106	250	250	347	348	97	97	90-110	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2706316												2706317	
Parameter	Units	10403310001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Chemical Oxygen Demand	mg/L	408	250	250	643	638	94	92	90-110	1	20		

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

QC Batch:	126169	Analysis Method:	SM 5310C
QC Batch Method:	SM 5310C	Analysis Description:	5310C TOC
Associated Lab Samples:	10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008		

METHOD BLANK:	501462	Matrix:	Water
Associated Lab Samples:	10403555001, 10403555002, 10403555003, 10403555004, 10403555005, 10403555006, 10403555007, 10403555008		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	09/20/17 16:01	

LABORATORY CONTROL SAMPLE: 501463						
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.8	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 501464												501465	
Parameter	Units	10403556001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Total Organic Carbon	mg/L	2.9	25	25	29.6	29.0	106	104	80-120	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 501466												501467	
Parameter	Units	10403555001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Total Organic Carbon	mg/L	0.34J	25	25	26.0	26.3	102	104	80-120	1	20		

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

FS The sample was filtered in the laboratory prior to analysis.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10403555001	Lashow-AG-GW-091217	RSK 175	497258		
10403555002	Lashow-DOM-GW-091217	RSK 175	497258		
10403555003	SILVA-GW-091217	RSK 175	497258		
10403555004	Lang-GW-091217	RSK 175	497258		
10403555005	STARK-GW-091217	RSK 175	497258		
10403555006	THORSON-GW-091217	RSK 175	497258		
10403555007	ASHER-GW-091217	RSK 175	497258		
10403555008	REED-GW-091317	RSK 175	497453		
10403555001	Lashow-AG-GW-091217	EPA 3010	497163	6010C Met	498284
10403555002	Lashow-DOM-GW-091217	EPA 3010	497163	6010C Met	498284
10403555003	SILVA-GW-091217	EPA 3010	497163	6010C Met	498284
10403555004	Lang-GW-091217	EPA 3010	497163	6010C Met	498284
10403555005	STARK-GW-091217	EPA 3010	497163	6010C Met	498284
10403555006	THORSON-GW-091217	EPA 3010	497163	6010C Met	498284
10403555007	ASHER-GW-091217	EPA 3010	497163	6010C Met	498284
10403555008	REED-GW-091317	EPA 3010	497163	6010C Met	498284
10403555001	Lashow-AG-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555002	Lashow-DOM-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555003	SILVA-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555004	Lang-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555005	STARK-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555006	THORSON-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555007	ASHER-GW-091217	EPA 7470A	497189	EPA 7470A	498553
10403555008	REED-GW-091317	EPA 7470A	497189	EPA 7470A	498553
10403555001	Lashow-AG-GW-091217	SM 2320B	498358		
10403555002	Lashow-DOM-GW-091217	SM 2320B	498358		
10403555003	SILVA-GW-091217	SM 2320B	498358		
10403555004	Lang-GW-091217	SM 2320B	498358		
10403555005	STARK-GW-091217	SM 2320B	498358		
10403555006	THORSON-GW-091217	SM 2320B	498358		
10403555007	ASHER-GW-091217	SM 2320B	498358		
10403555008	REED-GW-091317	SM 2320B	498840		
10403555001	Lashow-AG-GW-091217	SM 2540C	497458		
10403555002	Lashow-DOM-GW-091217	SM 2540C	497458		
10403555003	SILVA-GW-091217	SM 2540C	497458		
10403555004	Lang-GW-091217	SM 2540C	497458		
10403555005	STARK-GW-091217	SM 2540C	497458		
10403555006	THORSON-GW-091217	SM 2540C	497458		
10403555007	ASHER-GW-091217	SM 2540C	497458		
10403555008	REED-GW-091317	SM 2540C	497459		
10403555001	Lashow-AG-GW-091217	SM 4500-S-2 D	89537		
10403555002	Lashow-DOM-GW-091217	SM 4500-S-2 D	89537		
10403555003	SILVA-GW-091217	SM 4500-S-2 D	89537		
10403555004	Lang-GW-091217	SM 4500-S-2 D	89537		
10403555005	STARK-GW-091217	SM 4500-S-2 D	89537		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403555

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10403555006	THORSON-GW-091217	SM 4500-S-2 D	89537		
10403555007	ASHER-GW-091217	SM 4500-S-2 D	89537		
10403555008	REED-GW-091317	SM 4500-S-2 D	89537		
10403555001	Lashow-AG-GW-091217	EPA 300.0	497081		
10403555002	Lashow-DOM-GW-091217	EPA 300.0	497081		
10403555003	SILVA-GW-091217	EPA 300.0	497081		
10403555004	Lang-GW-091217	EPA 300.0	497081		
10403555005	STARK-GW-091217	EPA 300.0	497081		
10403555006	THORSON-GW-091217	EPA 300.0	497081		
10403555007	ASHER-GW-091217	EPA 300.0	497081		
10403555008	REED-GW-091317	EPA 300.0	497081		
10403555001	Lashow-AG-GW-091217	EPA 353.2	498887		
10403555002	Lashow-DOM-GW-091217	EPA 353.2	498887		
10403555003	SILVA-GW-091217	EPA 353.2	498887		
10403555004	Lang-GW-091217	EPA 353.2	498887		
10403555005	STARK-GW-091217	EPA 353.2	498887		
10403555006	THORSON-GW-091217	EPA 353.2	498887		
10403555007	ASHER-GW-091217	EPA 353.2	498887		
10403555008	REED-GW-091317	EPA 353.2	498887		
10403555001	Lashow-AG-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555002	Lashow-DOM-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555003	SILVA-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555004	Lang-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555005	STARK-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555006	THORSON-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555007	ASHER-GW-091217	EPA 410.4	497695	EPA 410.4	497868
10403555008	REED-GW-091317	EPA 410.4	497695	EPA 410.4	497868
10403555001	Lashow-AG-GW-091217	SM 5310C	126169		
10403555002	Lashow-DOM-GW-091217	SM 5310C	126169		
10403555003	SILVA-GW-091217	SM 5310C	126169		
10403555004	Lang-GW-091217	SM 5310C	126169		
10403555005	STARK-GW-091217	SM 5310C	126169		
10403555006	THORSON-GW-091217	SM 5310C	126169		
10403555007	ASHER-GW-091217	SM 5310C	126169		
10403555008	REED-GW-091317	SM 5310C	126169		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403555

### Section A

### Section B

### Section C

#### Required Client Information:

#### Required Project Information:

#### Invoice Information:

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Walsh
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Requested Due Date: 10 Day Standard	Project Name: Freeman WA-Grain Handling Facility	Pace Project Manager: Jennifer Gross
	Project #: 1497	Pace Profile #: 36447 / 4
Regulatory Agency		
State / Location		
WA / Freeman		

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						ANALYSES TEST	Requested Analysis Filtered (Y/N)										MSMSD Requested							
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Y/N	Y	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethane RSK175		COD 410.4	Nitrate+Nitrite 363.2					
						DATE	TIME	DATE	TIME																											
1	Lashaw-AG-GW-091217				WTG			9-12-17	1218		8																									001
2	Lashaw-DOM-GW-091217								1140		8																								002	
3	SILVA-GW-091217								1335		8																								003	
4	Lang-GW-091217								1100		8																								004	
5	STARK-GW-091217								1454		8																								005	
6	THORSON-GW-091217								1420		8																								006	
7	ASHER-GW-091217								1520		8																								007	
8	REED-GW-091317				LL			9-13-17	1030		8																								008	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Short hold analyses are in bold	<i>[Signature]</i> / CH2M	9-15-17	1154	<i>[Signature]</i>	9/16/17	855	2-9	3-9	7	7	7
*Field filtered by client							3-9	5-4			

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<i>L.K. Baumann</i>					
SIGNATURE of SAMPLER:	<i>[Signature]</i>	DATE Signed:	9-15-17			

WO#: 10403555



10403555

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: ARM Hill - UPR Project #: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other: \_\_\_\_\_

Tracking Number: 702145755392, 702145755381, 702145755418,  
702145755380, 702145755472

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS Temp Blank?  Yes  No

Thermometer Used:  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 2.2, 3.0, 4.1, 2.1, 5.9 Cooler Temp Corrected (°C): 2.4, 3.4, 3.9, 0.7, 5.4 Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: 1.2, -0.5 Date and Initials of Person Examining Contents: OT 9/16/17

USDA Regulated Soil  N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-8</u> <u>1/1</u> <u>1/1</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, (TOC) DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: Lindsey B Date/Time: 9/18/17

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1355</u>	Temp: <u>2.2, 3.0, 4.1</u> Corrected: <u>2.4, 3.4</u>
Time: <u>1410</u>	Temp: <u>2.1, 5.9</u> Temp: <u>3.9, 0.7</u>
Time: _____	Temp: _____ Corrected Temp: <u>5.4</u>

Ok to proceed out of hold.

Project Manager Review: Amanda J. Albrecht Date: 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
out of held	kishino-Ag-GW-0911217	1/1 BP26
" "	kishino-Dom-GW-0911217	" "
" "	Silver-GW-0911217	" "
" "	Lang-GW-091217	" "
" "	Stank-GW-091217	" "
" "	Thorsen-GW-091217	" "
" "	Ajlar-GW-091217	" "

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

Chain of Custody \_\_\_\_\_

WO#: 2061493



2061493

Analytical®  
www.pacelabs.com

Workorder: 10403555

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 9/16/2017

Results Requested By: 10/2/2017

Report To		Subcontract To				Requested Analysis																		
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																						
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										LAB USE ONLY								
						Other																		
1	Lashow-AG-GW-091217	PS	9/12/2017 12:18	10403555001	Water	1																		
2	Lashow-DOM-GW-091217	PS	9/12/2017 11:40	10403555002	Water	1																		
3	SILVA-GW-091217	PS	9/12/2017 13:35	10403555003	Water	1																		
4	Lang-GW-091217	PS	9/12/2017 11:00	10403555004	Water	1																		
5	STARK-GW-091217	PS	9/12/2017 14:54	10403555005	Water	1																		
6	THORSON-GW-091217	PS	9/12/2017 14:20	10403555006	Water	1																		
7	ASHER-GW-091217	PS	9/12/2017 15:20	10403555007	Water	1																		
8	REED-GW-091317	PS	9/13/2017 10:30	10403555008	Water	1																		

Sample 4500

Transfers					Comments	
Released By	Date/Time	Received By	Date/Time			
	9/18/17		9/19/17 850			
FedEx	9/17/17 850	Pace	9/17/17 850			

Cooler Temperature on Receipt	1.8 °C	Custody Seal Y or N	Received on ice Y or N	Samples Intact Y or N
-------------------------------	--------	---------------------	------------------------	-----------------------

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Sample Condition Upon

WO#: 2061493

PM: CMM

Due Date: 10/02/17

Pr

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 9-19-17 J

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_







Document Name:  
Sample Condition Upon Receipt Form

Document Revised: 15Mar2016  
Page 1 of 1

Document No.:  
F-VM-C-001-Rev.10

Issuing Authority:  
Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name:

Pace - Sulphur

Project #:

**WO# : 1296706**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

PM: HRZ Due Date: 10/03/17  
CLIENT: PACE MPLS

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.7 Cooler Temp Corrected °C: 1.0 Biological Tissue Frozen?  Yes  No  NA  
Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 9-18-17 43

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>Wt</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 9-19-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 12, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 Freeman WA-Grain Handling-Revised Report  
Pace Project No.: 10403556

Dear Steve Demus:

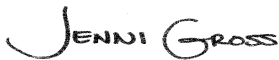
Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on December 12th, 2017 to report TOC results for samples 1 and 3.

This report was revised on December 12, 2017 to report results for 5310 TOC on samples (10403556001) MW-2D-GW-091417 and (10403556003) MW-3D-GW-091417.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill

Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill



## REPORT OF LABORATORY ANALYSIS

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December 12, 2017

Page 2

cc: Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling-Revised Report  
Pace Project No.: 10403556

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403556001	MW-2D-GW-091417	Water	09/14/17 09:30	09/16/17 08:55
10403556002	MW-14D-GW-091417	Water	09/14/17 13:05	09/16/17 08:55
10403556003	MW-3D-GW-091417	Water	09/14/17 14:50	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403556001	MW-2D-GW-091417	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10403556002	MW-14D-GW-091417	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10403556003	MW-3D-GW-091417	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10403556001</b>	<b>MW-2D-GW-091417</b>					
RSK 175	Ethane	7.2J	ug/L	10.0	09/19/17 13:17	
RSK 175	Ethene	5.0J	ug/L	10.0	09/19/17 13:17	
RSK 175	Methane	187	ug/L	10.0	09/19/17 13:17	
6010C Met	Aluminum, Dissolved	40.6J	ug/L	200	09/26/17 14:13	
6010C Met	Barium, Dissolved	101	ug/L	10.0	09/26/17 14:13	
6010C Met	Calcium, Dissolved	37200	ug/L	500	09/26/17 14:13	
6010C Met	Cobalt, Dissolved	1.4J	ug/L	10.0	09/26/17 14:13	
6010C Met	Iron, Dissolved	1320	ug/L	50.0	09/26/17 14:13	
6010C Met	Magnesium, Dissolved	11600	ug/L	500	09/26/17 14:13	
6010C Met	Manganese, Dissolved	1910	ug/L	5.0	09/26/17 14:13	
6010C Met	Nickel, Dissolved	4.2J	ug/L	20.0	09/26/17 14:13	
6010C Met	Potassium, Dissolved	5730	ug/L	2500	09/26/17 14:13	
6010C Met	Sodium, Dissolved	19000	ug/L	1000	09/26/17 14:13	
6010C Met	Vanadium, Dissolved	0.56J	ug/L	15.0	09/26/17 14:13	
6010C Met	Zinc, Dissolved	5.4J	ug/L	20.0	09/26/17 14:13	
SM 2320B	Alkalinity, Total as CaCO3	175	mg/L	5.0	09/26/17 12:16	
SM 2540C	Total Dissolved Solids	198	mg/L	10.0	09/20/17 10:18	
EPA 300.0	Chloride	1.9	mg/L	1.2	09/16/17 19:25	
EPA 300.0	Sulfate	1.0J	mg/L	1.2	09/16/17 19:25	
EPA 353.2	Nitrogen, NO2 plus NO3	0.0086J	mg/L	0.020	09/26/17 13:44	
EPA 410.4	Chemical Oxygen Demand	39.4J	mg/L	50.0	09/20/17 13:47	
SM 5310C	Total Organic Carbon	2.9	mg/L	1.0	09/21/17 13:34	
<b>10403556002</b>	<b>MW-14D-GW-091417</b>					
RSK 175	Methane	2.9J	ug/L	10.0	09/19/17 13:24	
6010C Met	Aluminum, Dissolved	9050	ug/L	200	09/26/17 14:16	
6010C Met	Barium, Dissolved	87.3	ug/L	10.0	09/26/17 14:16	
6010C Met	Beryllium, Dissolved	0.11J	ug/L	5.0	09/26/17 14:16	
6010C Met	Calcium, Dissolved	34300	ug/L	500	09/26/17 14:16	
6010C Met	Chromium, Dissolved	7.6J	ug/L	10.0	09/26/17 14:16	
6010C Met	Cobalt, Dissolved	4.2J	ug/L	10.0	09/26/17 14:16	
6010C Met	Copper, Dissolved	4.2J	ug/L	10.0	09/26/17 14:16	
6010C Met	Iron, Dissolved	6330	ug/L	50.0	09/26/17 14:16	
6010C Met	Lead, Dissolved	11.0	ug/L	10.0	09/26/17 14:16	
6010C Met	Magnesium, Dissolved	11100	ug/L	500	09/26/17 14:16	
6010C Met	Manganese, Dissolved	1440	ug/L	5.0	09/26/17 14:16	
6010C Met	Nickel, Dissolved	7.6J	ug/L	20.0	09/26/17 14:16	
6010C Met	Potassium, Dissolved	1570J	ug/L	2500	09/26/17 14:16	
6010C Met	Sodium, Dissolved	43700	ug/L	1000	09/26/17 14:16	
6010C Met	Vanadium, Dissolved	16.5	ug/L	15.0	09/26/17 14:16	
6010C Met	Zinc, Dissolved	15.7J	ug/L	20.0	09/26/17 14:16	
EPA 7470A	Mercury, Dissolved	0.25	ug/L	0.20	09/26/17 15:38	
SM 2320B	Alkalinity, Total as CaCO3	167	mg/L	5.0	09/26/17 12:21	
SM 2540C	Total Dissolved Solids	315	mg/L	10.0	09/20/17 10:18	
EPA 300.0	Chloride	4.3	mg/L	1.2	09/16/17 19:40	
EPA 300.0	Nitrate as N	0.048J	mg/L	0.10	09/16/17 19:40	H1
EPA 300.0	Sulfate	44.0	mg/L	1.2	09/16/17 19:40	
EPA 353.2	Nitrogen, NO2 plus NO3	0.026	mg/L	0.020	09/26/17 13:45	FS

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403556002</b>	<b>MW-14D-GW-091417</b>					
EPA 410.4	Chemical Oxygen Demand	79.2	mg/L	50.0	09/20/17 13:47	
SM 5310C	Total Organic Carbon	11.7	mg/L	5.0	09/20/17 18:08	
<b>10403556003</b>	<b>MW-3D-GW-091417</b>					
RSK 175	Methane	1.6J	ug/L	10.0	09/19/17 13:31	
6010C Met	Aluminum, Dissolved	39.5J	ug/L	200	09/26/17 14:19	
6010C Met	Barium, Dissolved	44.7	ug/L	10.0	09/26/17 14:19	
6010C Met	Calcium, Dissolved	30600	ug/L	500	09/26/17 14:19	
6010C Met	Chromium, Dissolved	0.72J	ug/L	10.0	09/26/17 14:19	
6010C Met	Iron, Dissolved	106	ug/L	50.0	09/26/17 14:19	
6010C Met	Magnesium, Dissolved	9370	ug/L	500	09/26/17 14:19	
6010C Met	Manganese, Dissolved	49.8	ug/L	5.0	09/26/17 14:19	
6010C Met	Nickel, Dissolved	2.1J	ug/L	20.0	09/26/17 14:19	
6010C Met	Potassium, Dissolved	1320J	ug/L	2500	09/26/17 14:19	
6010C Met	Sodium, Dissolved	15300	ug/L	1000	09/26/17 14:19	
6010C Met	Vanadium, Dissolved	1.8J	ug/L	15.0	09/26/17 14:19	
6010C Met	Zinc, Dissolved	3.1J	ug/L	20.0	09/26/17 14:19	
SM 2320B	Alkalinity, Total as CaCO3	152	mg/L	5.0	09/26/17 12:24	
SM 2540C	Total Dissolved Solids	207	mg/L	10.0	09/20/17 10:18	
SM 4500-S-2 D	Sulfide, Total	0.016J	mg/L	0.020	09/20/17 11:33	
EPA 300.0	Chloride	1.4	mg/L	1.2	09/16/17 19:55	
EPA 300.0	Nitrate as N	0.13	mg/L	0.10	09/16/17 19:55	H1
EPA 300.0	Sulfate	5.9	mg/L	1.2	09/16/17 19:55	
EPA 353.2	Nitrogen, NO2 plus NO3	0.14	mg/L	0.020	09/26/17 13:46	
EPA 410.4	Chemical Oxygen Demand	37.4J	mg/L	50.0	09/20/17 13:47	
SM 5310C	Total Organic Carbon	0.92J	mg/L	1.0	09/21/17 14:17	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 497163

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403287001

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 2703625)
  - Sodium, Dissolved
- MSD (Lab ID: 2703626)
  - Sodium, Dissolved

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498840

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403809002,10403938001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2712337)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 89612

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2061562001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 383922)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 89612

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- MW-14D-GW-091417 (Lab ID: 10403556002)
- Sulfide, Total

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

### General Information:

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW-14D-GW-091417 (Lab ID: 10403556002)
- MW-2D-GW-091417 (Lab ID: 10403556001)
- MW-3D-GW-091417 (Lab ID: 10403556003)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 497081

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403555006,7573730001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2703292)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2703293)
  - Chloride
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498887

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403783001,10403783002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2712506)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2712507)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** December 12, 2017

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

**Sample: MW-2D-GW-091417**      **Lab ID: 10403556001**      Collected: 09/14/17 09:30      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	7.2J	ug/L	10.0	4.9	1		09/19/17 13:17	74-84-0	
Ethene	5.0J	ug/L	10.0	0.68	1		09/19/17 13:17	74-85-1	
Methane	187	ug/L	10.0	1.1	1		09/19/17 13:17	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	40.6J	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 14:13	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 14:13	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 14:13	7440-38-2	
Barium, Dissolved	101	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 14:13	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 14:13	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 14:13	7440-43-9	
Calcium, Dissolved	37200	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 14:13	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 14:13	7440-47-3	
Cobalt, Dissolved	1.4J	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 14:13	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 14:13	7440-50-8	
Iron, Dissolved	1320	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 14:13	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 14:13	7439-92-1	
Magnesium, Dissolved	11600	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 14:13	7439-95-4	
Manganese, Dissolved	1910	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 14:13	7439-96-5	
Nickel, Dissolved	4.2J	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 14:13	7440-02-0	
Potassium, Dissolved	5730	ug/L	2500	126	1	09/21/17 10:04	09/26/17 14:13	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 14:13	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 14:13	7440-22-4	
Sodium, Dissolved	19000	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 14:13	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 14:13	7440-28-0	
Vanadium, Dissolved	0.56J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 14:13	7440-62-2	
Zinc, Dissolved	5.4J	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 14:13	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:36	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	175	mg/L	5.0	1.4	1		09/26/17 12:16		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	198	mg/L	10.0	5.0	1		09/20/17 10:18		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/20/17 11:33	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.9	mg/L	1.2	0.14	1		09/16/17 19:25	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		09/16/17 19:25	14797-55-8	H1
Sulfate	1.0J	mg/L	1.2	0.27	1		09/16/17 19:25	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Sample: MW-2D-GW-091417**      **Lab ID: 10403556001**      Collected: 09/14/17 09:30      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.0086J</b>	mg/L	0.020	0.0075	1		09/26/17 13:44		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>39.4J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:47		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>2.9</b>	mg/L	1.0	0.20	1		09/21/17 13:34	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

**Sample: MW-14D-GW-091417**      **Lab ID: 10403556002**      Collected: 09/14/17 13:05      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 13:24	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 13:24	74-85-1	
Methane	2.9J	ug/L	10.0	1.1	1		09/19/17 13:24	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	9050	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 14:16	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 14:16	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 14:16	7440-38-2	
Barium, Dissolved	87.3	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 14:16	7440-39-3	
Beryllium, Dissolved	0.11J	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 14:16	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 14:16	7440-43-9	
Calcium, Dissolved	34300	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 14:16	7440-70-2	
Chromium, Dissolved	7.6J	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 14:16	7440-47-3	
Cobalt, Dissolved	4.2J	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 14:16	7440-48-4	
Copper, Dissolved	4.2J	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 14:16	7440-50-8	
Iron, Dissolved	6330	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 14:16	7439-89-6	
Lead, Dissolved	11.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 14:16	7439-92-1	
Magnesium, Dissolved	11100	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 14:16	7439-95-4	
Manganese, Dissolved	1440	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 14:16	7439-96-5	
Nickel, Dissolved	7.6J	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 14:16	7440-02-0	
Potassium, Dissolved	1570J	ug/L	2500	126	1	09/21/17 10:04	09/26/17 14:16	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 14:16	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 14:16	7440-22-4	
Sodium, Dissolved	43700	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 14:16	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 14:16	7440-28-0	
Vanadium, Dissolved	16.5	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 14:16	7440-62-2	
Zinc, Dissolved	15.7J	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 14:16	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	0.25	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:38	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	167	mg/L	5.0	1.4	1		09/26/17 12:21		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	315	mg/L	10.0	5.0	1		09/20/17 10:18		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.025	mg/L	0.10	0.025	5		09/20/17 11:33	18496-25-8	D3
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	4.3	mg/L	1.2	0.14	1		09/16/17 19:40	16887-00-6	
Nitrate as N	0.048J	mg/L	0.10	0.0079	1		09/16/17 19:40	14797-55-8	H1
Sulfate	44.0	mg/L	1.2	0.27	1		09/16/17 19:40	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Sample: MW-14D-GW-091417**      **Lab ID: 10403556002**      Collected: 09/14/17 13:05      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.026</b>	mg/L	0.020	0.0075	1		09/26/17 13:45		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>79.2</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:47		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>11.7</b>	mg/L	5.0	1.0	5		09/20/17 18:08	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

**Sample: MW-3D-GW-091417**      **Lab ID: 10403556003**      Collected: 09/14/17 14:50      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/19/17 13:31	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/19/17 13:31	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		09/19/17 13:31	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	39.5J	ug/L	200	8.6	1	09/21/17 10:04	09/26/17 14:19	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/21/17 10:04	09/26/17 14:19	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/21/17 10:04	09/26/17 14:19	7440-38-2	
Barium, Dissolved	44.7	ug/L	10.0	0.22	1	09/21/17 10:04	09/26/17 14:19	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/21/17 10:04	09/26/17 14:19	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/21/17 10:04	09/26/17 14:19	7440-43-9	
Calcium, Dissolved	30600	ug/L	500	24.7	1	09/21/17 10:04	09/26/17 14:19	7440-70-2	
Chromium, Dissolved	0.72J	ug/L	10.0	0.50	1	09/21/17 10:04	09/26/17 14:19	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/21/17 10:04	09/26/17 14:19	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	09/21/17 10:04	09/26/17 14:19	7440-50-8	
Iron, Dissolved	106	ug/L	50.0	16.7	1	09/21/17 10:04	09/26/17 14:19	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/21/17 10:04	09/26/17 14:19	7439-92-1	
Magnesium, Dissolved	9370	ug/L	500	2.6	1	09/21/17 10:04	09/26/17 14:19	7439-95-4	
Manganese, Dissolved	49.8	ug/L	5.0	0.38	1	09/21/17 10:04	09/26/17 14:19	7439-96-5	
Nickel, Dissolved	2.1J	ug/L	20.0	1.1	1	09/21/17 10:04	09/26/17 14:19	7440-02-0	
Potassium, Dissolved	1320J	ug/L	2500	126	1	09/21/17 10:04	09/26/17 14:19	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/21/17 10:04	09/26/17 14:19	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/21/17 10:04	09/26/17 14:19	7440-22-4	
Sodium, Dissolved	15300	ug/L	1000	44.6	1	09/21/17 10:04	09/26/17 14:19	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/21/17 10:04	09/26/17 14:19	7440-28-0	
Vanadium, Dissolved	1.8J	ug/L	15.0	0.42	1	09/21/17 10:04	09/26/17 14:19	7440-62-2	
Zinc, Dissolved	3.1J	ug/L	20.0	1.8	1	09/21/17 10:04	09/26/17 14:19	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/22/17 10:07	09/26/17 15:41	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	152	mg/L	5.0	1.4	1		09/26/17 12:24		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	207	mg/L	10.0	5.0	1		09/20/17 10:18		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.016J	mg/L	0.020	0.0050	1		09/20/17 11:33	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.4	mg/L	1.2	0.14	1		09/16/17 19:55	16887-00-6	
Nitrate as N	0.13	mg/L	0.10	0.0079	1		09/16/17 19:55	14797-55-8	H1
Sulfate	5.9	mg/L	1.2	0.27	1		09/16/17 19:55	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

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**Sample: MW-3D-GW-091417**      **Lab ID: 10403556003**      Collected: 09/14/17 14:50      Received: 09/16/17 08:55      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.14</b>	mg/L	0.020	0.0075	1		09/26/17 13:46		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>37.4J</b>	mg/L	50.0	15.8	1	09/20/17 08:08	09/20/17 13:47		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.92J</b>	mg/L	1.0	0.20	1		09/21/17 14:17	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 497453 Analysis Method: RSK 175  
 QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
 Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2704915 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	09/19/17 11:32	
Ethene	ug/L	<0.68	10.0	0.68	09/19/17 11:32	
Methane	ug/L	1.6J	10.0	1.1	09/19/17 11:32	

LABORATORY CONTROL SAMPLE & LCSD: 2704916

2704917

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	108	103	95	90	85-115	4	20	
Ethene	ug/L	106	101	96.3	95	91	85-115	5	20	
Methane	ug/L	60.7	56.7	53.6	93	88	85-115	6	20	

SAMPLE DUPLICATE: 2704918

Parameter	Units	60253123005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	296	282	5	20	

SAMPLE DUPLICATE: 2704919

Parameter	Units	10403686002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	13.9	3.4J		20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 497189 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2703727 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	09/26/17 15:04	

LABORATORY CONTROL SAMPLE: 2703728

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703729 2703730

Parameter	Units	10403555002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	4.8	4.9	97	97	80-120	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 497163 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2703623 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	09/26/17 12:59	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	09/26/17 12:59	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	09/26/17 12:59	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	09/26/17 12:59	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	09/26/17 12:59	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	09/26/17 12:59	
Calcium, Dissolved	ug/L	<24.7	500	24.7	09/26/17 12:59	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	09/26/17 12:59	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	09/26/17 12:59	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	09/26/17 12:59	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	09/26/17 12:59	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	09/26/17 12:59	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	09/26/17 12:59	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	09/26/17 12:59	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	09/26/17 12:59	
Potassium, Dissolved	ug/L	<126	2500	126	09/26/17 12:59	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	09/26/17 12:59	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	09/26/17 12:59	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	09/26/17 12:59	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	09/26/17 12:59	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	09/26/17 12:59	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	09/26/17 12:59	

LABORATORY CONTROL SAMPLE: 2703624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21500	108	80-120	
Antimony, Dissolved	ug/L	1000	1050	105	80-120	
Arsenic, Dissolved	ug/L	1000	1020	102	80-120	
Barium, Dissolved	ug/L	1000	1050	105	80-120	
Beryllium, Dissolved	ug/L	1000	1030	103	80-120	
Cadmium, Dissolved	ug/L	1000	1020	102	80-120	
Calcium, Dissolved	ug/L	20000	19800	99	80-120	
Chromium, Dissolved	ug/L	1000	1020	102	80-120	
Cobalt, Dissolved	ug/L	1000	1020	102	80-120	
Copper, Dissolved	ug/L	1000	1030	103	80-120	
Iron, Dissolved	ug/L	20000	20300	102	80-120	
Lead, Dissolved	ug/L	1000	1040	104	80-120	
Magnesium, Dissolved	ug/L	20000	20600	103	80-120	
Manganese, Dissolved	ug/L	1000	1040	104	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

LABORATORY CONTROL SAMPLE: 2703624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1020	102	80-120	
Potassium, Dissolved	ug/L	20000	20700	104	80-120	
Selenium, Dissolved	ug/L	1000	1080	108	80-120	
Silver, Dissolved	ug/L	500	506	101	80-120	
Sodium, Dissolved	ug/L	20000	20800	104	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	996	100	80-120	
Zinc, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703625 2703626

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10403287001 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	ND	20000	20000	22600	22600	113	113	75-125	0	20
Antimony, Dissolved	ug/L	ND	1000	1000	1110	1120	111	112	75-125	1	20
Arsenic, Dissolved	ug/L	ND	1000	1000	1080	1090	108	109	75-125	1	20
Barium, Dissolved	ug/L	21.7	1000	1000	1040	1030	102	101	75-125	1	20
Beryllium, Dissolved	ug/L	ND	1000	1000	1070	1070	107	107	75-125	0	20
Cadmium, Dissolved	ug/L	ND	1000	1000	1050	1050	105	105	75-125	0	20
Calcium, Dissolved	ug/L	168000	20000	20000	188000	185000	96	83	75-125	1	20
Chromium, Dissolved	ug/L	ND	1000	1000	994	994	99	99	75-125	0	20
Cobalt, Dissolved	ug/L	ND	1000	1000	978	976	98	97	75-125	0	20
Copper, Dissolved	ug/L	ND	1000	1000	1090	1070	108	107	75-125	1	20
Iron, Dissolved	ug/L	ND	20000	20000	19900	19900	99	99	75-125	0	20
Lead, Dissolved	ug/L	ND	1000	1000	975	974	98	97	75-125	0	20
Magnesium, Dissolved	ug/L	173000	20000	20000	192000	190000	98	88	75-125	1	20
Manganese, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	75-125	0	20
Nickel, Dissolved	ug/L	ND	1000	1000	963	963	96	96	75-125	0	20
Potassium, Dissolved	ug/L	14900	20000	20000	39100	39000	121	120	75-125	0	20
Selenium, Dissolved	ug/L	190	1000	1000	1340	1350	114	116	75-125	1	20
Silver, Dissolved	ug/L	ND	500	500	530	523	106	105	75-125	1	20
Sodium, Dissolved	ug/L	417000	20000	20000	430000	428000	68	58	75-125	0	20 P6
Thallium, Dissolved	ug/L	ND	1000	1000	910	908	90	90	75-125	0	20
Vanadium, Dissolved	ug/L	ND	1000	1000	1010	997	101	100	75-125	1	20
Zinc, Dissolved	ug/L	ND	1000	1000	952	951	94	94	75-125	0	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report  
Pace Project No.: 10403556

QC Batch: 498840 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2712334 Matrix: Water  
Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	09/26/17 10:27	

LABORATORY CONTROL SAMPLE & LCSD: 2712335 2712336

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	39.4	41.4	99	104	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712337 2712338

Parameter	Units	10403938001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	189	40	40	263	224	184	87	80-120	16	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712339 2712340

Parameter	Units	10403809002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	82.4	40	40	120	116	93	84	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 497715

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2706392

Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	09/20/17 10:18	

LABORATORY CONTROL SAMPLE: 2706393

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	962	96	80-120	

SAMPLE DUPLICATE: 2706394

Parameter	Units	10403539007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	233	232	0	10	

SAMPLE DUPLICATE: 2706395

Parameter	Units	10403539008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	287	281	2	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 89612 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 383919 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	09/20/17 11:32	

LABORATORY CONTROL SAMPLE: 383920

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	105	90-110	

MATRIX SPIKE SAMPLE: 383922

Parameter	Units	2061562001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.056	28	75-125	M1

SAMPLE DUPLICATE: 383921

Parameter	Units	2061562001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 497081 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2703290 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	09/19/17 19:08	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	09/19/17 19:08	
Sulfate	mg/L	<0.27	1.2	0.27	09/19/17 19:08	

LABORATORY CONTROL SAMPLE: 2703291

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.0	104	90-110	
Nitrate as N	mg/L	1	1.0	101	90-110	
Sulfate	mg/L	12.5	12.8	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703292 2703293

Parameter	Units	7573730001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	20.9	12.5	12.5	30.4	30.3	76	76	90-110	0	20	M1	
Nitrate as N	mg/L	ND	1	1	0.96	0.96	92	91	90-110	0	20		
Sulfate	mg/L	12.3	12.5	12.5	22.8	22.8	84	84	90-110	0	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2703370 2703371

Parameter	Units	10403555006		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	1.2J	12.5	12.5	13.2	13.2	96	96	90-110	0	20		
Nitrate as N	mg/L	<0.0079	1	1	0.95	0.94	95	94	90-110	0	20		
Sulfate	mg/L	3.0	12.5	12.5	14.5	14.5	92	92	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 498887 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2712502 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	09/26/17 13:51	FS

LABORATORY CONTROL SAMPLE: 2712503

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712504 2712505

Parameter	Units	10403783001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	ND	1	1.0	1	0.96	101	96	90-110	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712506 2712507

Parameter	Units	10403783002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	ND	1	0.091	1	0.091	9	8	90-110	1	20	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

QC Batch: 497695 Analysis Method: EPA 410.4

QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD

Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 2706312 Matrix: Water

Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	09/20/17 13:41	

LABORATORY CONTROL SAMPLE: 2706313

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	298	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2706314 2706315

Parameter	Units	10403092001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Chemical Oxygen Demand	mg/L	106	250	250	347	348	97	97	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2706316 2706317

Parameter	Units	10403310001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Chemical Oxygen Demand	mg/L	408	250	250	643	638	94	92	90-110	1	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling-Revised Report  
Pace Project No.: 10403556

QC Batch: 126169 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10403556001, 10403556002, 10403556003

METHOD BLANK: 501462 Matrix: Water  
Associated Lab Samples: 10403556001, 10403556002, 10403556003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	09/20/17 16:01	

LABORATORY CONTROL SAMPLE: 501463

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.8	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 501464 501465

Parameter	Units	501464		501465		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10403556001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	2.9	25	25	29.6	29.0	106	104	80-120	2	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 501466 501467

Parameter	Units	501466		501467		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10403555001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.34J	25	25	26.0	26.3	102	104	80-120	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling-Revised Report

Pace Project No.: 10403556

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling-Revised Report  
Pace Project No.: 10403556

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10403556001	MW-2D-GW-091417	RSK 175	497453		
10403556002	MW-14D-GW-091417	RSK 175	497453		
10403556003	MW-3D-GW-091417	RSK 175	497453		
10403556001	MW-2D-GW-091417	EPA 3010	497163	6010C Met	498284
10403556002	MW-14D-GW-091417	EPA 3010	497163	6010C Met	498284
10403556003	MW-3D-GW-091417	EPA 3010	497163	6010C Met	498284
10403556001	MW-2D-GW-091417	EPA 7470A	497189	EPA 7470A	498553
10403556002	MW-14D-GW-091417	EPA 7470A	497189	EPA 7470A	498553
10403556003	MW-3D-GW-091417	EPA 7470A	497189	EPA 7470A	498553
10403556001	MW-2D-GW-091417	SM 2320B	498840		
10403556002	MW-14D-GW-091417	SM 2320B	498840		
10403556003	MW-3D-GW-091417	SM 2320B	498840		
10403556001	MW-2D-GW-091417	SM 2540C	497715		
10403556002	MW-14D-GW-091417	SM 2540C	497715		
10403556003	MW-3D-GW-091417	SM 2540C	497715		
10403556001	MW-2D-GW-091417	SM 4500-S-2 D	89612		
10403556002	MW-14D-GW-091417	SM 4500-S-2 D	89612		
10403556003	MW-3D-GW-091417	SM 4500-S-2 D	89612		
10403556001	MW-2D-GW-091417	EPA 300.0	497081		
10403556002	MW-14D-GW-091417	EPA 300.0	497081		
10403556003	MW-3D-GW-091417	EPA 300.0	497081		
10403556001	MW-2D-GW-091417	EPA 353.2	498887		
10403556002	MW-14D-GW-091417	EPA 353.2	498887		
10403556003	MW-3D-GW-091417	EPA 353.2	498887		
10403556001	MW-2D-GW-091417	EPA 410.4	497695	EPA 410.4	497868
10403556002	MW-14D-GW-091417	EPA 410.4	497695	EPA 410.4	497868
10403556003	MW-3D-GW-091417	EPA 410.4	497695	EPA 410.4	497868
10403556001	MW-2D-GW-091417	SM 5310C	126169		
10403556002	MW-14D-GW-091417	SM 5310C	126169		
10403556003	MW-3D-GW-091417	SM 5310C	126169		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403556

Section A

Section B

Section C

Required Client Information:

Required Project Information:

Invoice Information:

Page: 1 Of 1

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Walsh
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Requested Due Date: <b>10 Day Standard</b>	Project Name: Freeman WA-Grain Handling Facility	Pace Project Manager: Jennifer Gross
	Project #: 1497	Pace Profile #: 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test Y/N	Requested Analysis Filtered (Y/N)																			
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8260	6010/1470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5810	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2	MS/MSD Requested									
						DATE	TIME	DATE	TIME																													
1	MW20-GW-091417			WT			9/14/17	9:30		8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	001
2	MW14D-GW-091417							13:05		8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	002	
3	MW3D-GW-091417							14:50		8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	003	
4																																						
5																																						
6																																						
7																																						
8																																						
9																																						
10																																						
11																																						
12																																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	<i>JD/CH2M</i>	9/15/17	16:00	<i>[Signature]</i>	9/14/17	9:55	2.4 3.4 3.9 3.7 5.4
*Field filtered by client							

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	SIGNATURE of SAMPLER:					
	<i>Steve Demus</i>					
	<i>[Signature]</i>					
		DATE Signed:				
			9-15-17			

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M HILL - UPRR **Project #:** \_\_\_\_\_

WO#: 10403556



10403556

Optional: Proj. Due Date: \_\_\_\_\_

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

**Tracking Number:** 702145755792, 702145755381, 702145755418, 702145753780, 702145755413

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No

**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: PS **Temp Blank?**  Yes  No

**Thermometer**  151401163  G87A9155100842 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Used:**  151401163  G87A9155100842 **Cooler Temp Read (°C):** 2.2, 3.0, 4.1, 5.9 **Cooler Temp Corrected (°C):** 2.4, 3.4, 3.9, 0.7, 5.4 **Biological Tissue Frozen?**  Yes  No  N/A

**Temp should be above freezing to 6°C** **Correction Factor:** 10.2, 2.5 **Date and Initials of Person Examining Contents:** 9/16/17

**USDA Regulated Soil**  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # 1-3 1/1 1/1
Initial when completed: _____ Lot # of added preservative: _____	
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No

Person Contacted: Lindsey B. Date/Time: 9/18/17

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1355</u> Temp: <u>2.2, 5.0, 4.1, 1.2, 5.9</u>	Corrected: <u>2.4, 2.4, 3.9, 0.7, 5.4</u>
Time: <u>1410</u> put in cooler	Corrected Temp: <u>5.4</u>
Time: _____ Temp: _____	Corrected Temp: _____

**Project Manager Review:** Amanda J Albrecht **Date:** 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)







1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon R

Proj

# WO#: 2061494

PM: CMM

Due Date: 10/02/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

**Thermometer Used:**  
 Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 9-19-17 J

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Chain of Custody

**WO#: 1296705**  
 PM: HRZ Due Date: 10/03/17  
 CLIENT: PACE MPLS

Workorder: 10403556 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 9/16/2017 Results Requested By: 10/2/2017

Report To		Subcontract To				Requested Analysis																										
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				<div style="display: flex; justify-content: space-between;"> <span>5636267 / TOC.5310</span> <span>LAB USE ONLY</span> </div>																										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Preserved Containers														
																		H2SO4														
1	MW-2D-GW-091417	PS	9/14/2017 09:30	10403556001	Water													1														
2	MW-14D-GW-091417	PS	9/14/2017 13:05	10403556002	Water													1														
3	MW-3D-GW-091417	PS	9/14/2017 14:50	10403556003	Water	1																										
4																																
5																																
Transfers												Comments																				
Released By	Date/Time	Received By	Date/Time																													
<i>[Signature]</i>	9/18/17	<i>CB</i>	9-18-17 1830																													
<i>CB</i>	9-18-17 2200	<i>B Mathew</i>	9/19/17 0745																													
3																																
Cooler Temperature on Receipt <u>2-8</u> °C				Custody Seal <u>(Y)</u> or N				Received on Ice <u>(Y)</u> or N				Samples Intact <u>(Y)</u> or N																				

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace - Mpls Project #: \_\_\_\_\_

**WO#: 1296705**  
 PM: HRZ Due Date: 10/03/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.5 Cooler Temp Corrected °C: 2.8 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 9-18-17 CB

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours	
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		13.
Headspace in VOA-Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased): _____			

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE  Y  N

TEMPERATURE WAIVER ON FILE  Y  N

Project Manager Review: [Signature] Date: 9-19-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 25, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

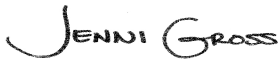
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403559

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403559001	Lashaw-AG-GW-091217	Water	09/12/17 12:18	09/16/17 08:55
10403559002	Lashaw-Dom-GW-091217	Water	09/12/17 11:40	09/16/17 08:55
10403559003	TB-091217	Water	09/12/17 07:00	09/16/17 08:55

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403559001	Lashaw-AG-GW-091217	EPA 8260B	DJB	83	PASI-M
10403559002	Lashaw-Dom-GW-091217	EPA 8260B	DJB	83	PASI-M
10403559003	TB-091217	EPA 8260B	DJB	83	PASI-M

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## SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403559001</b>	<b>Lashaw-AG-GW-091217</b>					
EPA 8260B	2-Butanone (MEK)	4.3J	ug/L	5.0	09/22/17 19:22	
EPA 8260B	Acetone	35.8	ug/L	20.0	09/22/17 19:22	
EPA 8260B	Carbon tetrachloride	1.5	ug/L	0.50	09/22/17 19:22	
EPA 8260B	Chloroform	0.66J	ug/L	1.0	09/22/17 19:22	
<b>10403559002</b>	<b>Lashaw-Dom-GW-091217</b>					
EPA 8260B	Acetone	47.7	ug/L	20.0	09/22/17 19:44	
EPA 8260B	Carbon tetrachloride	0.59	ug/L	0.50	09/22/17 19:44	
<b>10403559003</b>	<b>TB-091217</b>					
EPA 8260B	Acetone	15.9J	ug/L	20.0	09/22/17 00:08	
EPA 8260B	tert-Butyl Alcohol	7.5J	ug/L	10.0	09/22/17 00:08	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 25, 2017

### General Information:

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 498194

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2708552)
  - Bromomethane
- LCS (Lab ID: 2708553)
  - Bromomethane
- MS (Lab ID: 2708554)
  - Bromomethane
- MSD (Lab ID: 2708555)
  - Bromomethane
- TB-091217 (Lab ID: 10403559003)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 25, 2017

QC Batch: 498194

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404181007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708554)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Acetone
  - Carbon tetrachloride

QC Batch: 498365

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10403491012

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2709357)
  - 1,2,4-Trichlorobenzene
  - 1,2-Dibromo-3-chloropropane
  - 2-Butanone (MEK)
  - 2-Hexanone
  - 4-Methyl-2-pentanone (MIBK)
  - Acetone
  - Acrolein
  - Chloroethane
  - Dichlorodifluoromethane
  - Dichlorofluoromethane
  - Hexachloro-1,3-butadiene
  - Naphthalene
  - Tetrahydrofuran
  - Vinyl chloride

R1: RPD value was outside control limits.

- MSD (Lab ID: 2709358)
  - Bromomethane
  - Chloroethane
  - Chloromethane
  - Dichlorodifluoromethane
  - Dichlorofluoromethane
  - Hexachloro-1,3-butadiene
  - Trichlorofluoromethane
  - Vinyl chloride

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 25, 2017

Analyte Comments:

QC Batch: 498194

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2708554)
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Carbon tetrachloride

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10403559

Sample: Lashaw-AG-GW-091217 Lab ID: 10403559001 Collected: 09/12/17 12:18 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 19:22	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 19:22	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 19:22	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 19:22	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 19:22	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:22	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:22	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 19:22	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:22	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 19:22	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 19:22	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 19:22	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 19:22	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 19:22	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 19:22	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 19:22	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:22	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 19:22	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 19:22	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 19:22	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 19:22	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 19:22	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 19:22	594-20-7	
2-Butanone (MEK)	4.3J	ug/L	5.0	2.4	1		09/22/17 19:22	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 19:22	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 19:22	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 19:22	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 19:22	108-10-1	
Acetone	35.8	ug/L	20.0	8.8	1		09/22/17 19:22	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 19:22	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 19:22	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 19:22	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 19:22	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 19:22	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 19:22	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 19:22	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 19:22	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 19:22	75-15-0	
Carbon tetrachloride	1.5	ug/L	0.50	0.20	1		09/22/17 19:22	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 19:22	75-00-3	
Chloroform	0.66J	ug/L	1.0	0.46	1		09/22/17 19:22	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 19:22	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 19:22	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Sample: Lashaw-AG-GW-091217 Lab ID: 10403559001 Collected: 09/12/17 12:18 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 19:22	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 19:22	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 19:22	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 19:22	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 19:22	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 19:22	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 19:22	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 19:22	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 19:22	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 19:22	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 19:22	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 19:22	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 19:22	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 19:22	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 19:22	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 19:22	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 19:22	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 19:22	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 19:22	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 19:22	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 19:22	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 19:22	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:22	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 19:22	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 19:22	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 19:22	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 19:22	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 19:22	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 19:22	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 19:22	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	94	%	75-137		1		09/22/17 19:22	17060-07-0	
Toluene-d8 (S)	93	%	75-125		1		09/22/17 19:22	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1		09/22/17 19:22	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10403559

Sample: Lashaw-Dom-GW-091217 Lab ID: 10403559002 Collected: 09/12/17 11:40 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 19:44	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 19:44	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 19:44	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 19:44	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 19:44	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:44	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:44	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 19:44	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:44	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 19:44	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 19:44	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 19:44	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 19:44	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 19:44	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 19:44	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 19:44	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 19:44	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 19:44	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 19:44	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 19:44	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 19:44	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 19:44	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 19:44	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 19:44	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 19:44	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 19:44	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 19:44	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 19:44	108-10-1	
Acetone	47.7	ug/L	20.0	8.8	1		09/22/17 19:44	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 19:44	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 19:44	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 19:44	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 19:44	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 19:44	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 19:44	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 19:44	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 19:44	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 19:44	75-15-0	
Carbon tetrachloride	0.59	ug/L	0.50	0.20	1		09/22/17 19:44	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 19:44	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 19:44	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 19:44	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 19:44	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10403559

Sample: Lashaw-Dom-GW-091217 Lab ID: 10403559002 Collected: 09/12/17 11:40 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 19:44	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 19:44	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 19:44	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 19:44	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 19:44	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 19:44	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 19:44	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 19:44	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 19:44	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 19:44	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 19:44	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 19:44	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 19:44	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 19:44	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 19:44	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 19:44	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 19:44	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 19:44	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 19:44	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 19:44	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 19:44	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 19:44	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 19:44	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 19:44	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 19:44	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 19:44	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 19:44	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 19:44	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 19:44	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 19:44	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	95	%	75-137		1		09/22/17 19:44	17060-07-0	
Toluene-d8 (S)	92	%	75-125		1		09/22/17 19:44	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		09/22/17 19:44	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10403559

Sample: **TB-091217** Lab ID: **10403559003** Collected: 09/12/17 07:00 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 00:08	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 00:08	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 00:08	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 00:08	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 00:08	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 00:08	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 00:08	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 00:08	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 00:08	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 00:08	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 00:08	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 00:08	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 00:08	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 00:08	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 00:08	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 00:08	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 00:08	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 00:08	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 00:08	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 00:08	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 00:08	108-10-1	
Acetone	15.9J	ug/L	20.0	8.8	1		09/22/17 00:08	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 00:08	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 00:08	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 00:08	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 00:08	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 00:08	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 00:08	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 00:08	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 00:08	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 00:08	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 00:08	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 00:08	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

**Sample: TB-091217**      **Lab ID: 10403559003**      Collected: 09/12/17 07:00      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 00:08	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 00:08	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 00:08	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 00:08	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 00:08	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 00:08	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 00:08	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 00:08	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 00:08	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 00:08	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 00:08	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 00:08	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 00:08	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 00:08	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 00:08	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 00:08	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	994-05-8	
tert-Butyl Alcohol	7.5J	ug/L	10.0	2.2	1		09/22/17 00:08	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 00:08	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 00:08	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 00:08	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 00:08	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 00:08	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		09/22/17 00:08	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		09/22/17 00:08	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

QC Batch: 498194

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10403559003

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403559003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/21/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/21/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/21/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/21/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/21/17 23:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/21/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/21/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/21/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/21/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/21/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/21/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/21/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/21/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/21/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	09/21/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	09/21/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/21/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	09/21/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/21/17 23:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403559003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	09/21/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	09/21/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	09/21/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/21/17 23:24	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/21/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/21/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/21/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/21/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/21/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/21/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	09/21/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	09/21/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Styrene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/21/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/21/17 23:24	
Toluene	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/21/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/21/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/21/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/21/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/21/17 23:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		09/21/17 23:24	
4-Bromofluorobenzene (S)	%	100	75-125		09/21/17 23:24	
Toluene-d8 (S)	%	95	75-125		09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-136	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	23.3	116	71-138	
1,1,2-Trichloroethane	ug/L	20	21.4	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.1	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,3-Trichloropropane	ug/L	20	22.3	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.2	106	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	93	75-125	
1,2-Dichloropropane	ug/L	20	20.0	100	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	390	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	13.7	69	68-125	
2,2-Dichloropropane	ug/L	20	16.5	82	70-131	
2-Butanone (MEK)	ug/L	100	113	113	69-125	
2-Chlorotoluene	ug/L	20	19.9	99	75-125	
2-Hexanone	ug/L	100	121	121	73-129	
4-Chlorotoluene	ug/L	20	19.7	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	116	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	231	115	68-129	
Benzene	ug/L	20	18.5	92	75-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	19.9	100	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	7.2	36	34-143	CL
Carbon disulfide	ug/L	20	16.6	83	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	20.9	104	75-125	
Chloroethane	ug/L	20	20.9	104	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	17.5	88	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.7	94	74-141	
Dibromomethane	ug/L	20	22.1	110	75-125	
Dichlorodifluoromethane	ug/L	20	19.0	95	59-130	
Dichlorofluoromethane	ug/L	20	17.9	89	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.6	93	73-125	
Ethylbenzene	ug/L	20	19.7	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.4	97	75-125	
m&p-Xylene	ug/L	40	40.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	18.5	93	75-125	
Methylene Chloride	ug/L	20	17.3	86	73-125	
n-Butylbenzene	ug/L	20	19.1	96	75-125	
n-Propylbenzene	ug/L	20	19.9	100	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	19.9	100	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	19.2	96	75-125	
Styrene	ug/L	20	18.2	91	75-125	
tert-Amylmethyl ether	ug/L	20	18.6	93	71-126	
tert-Butyl Alcohol	ug/L	200	243	121	69-131	
tert-Butylbenzene	ug/L	20	19.0	95	75-125	
Tetrachloroethene	ug/L	20	19.0	95	75-125	
Tetrahydrofuran	ug/L	200	204	102	65-127	
Toluene	ug/L	20	19.6	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.6	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.6	88	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.0	80	30-150	
Trichloroethene	ug/L	20	20.3	101	75-125	
Trichlorofluoromethane	ug/L	20	20.6	103	71-140	
Vinyl acetate	ug/L	20	22.8	114	68-137	
Vinyl chloride	ug/L	20	19.6	98	70-125	
Xylene (Total)	ug/L	60	59.9	100	75-125	
1,2-Dichloroethane-d4 (S)	%			89	75-137	
4-Bromofluorobenzene (S)	%			96	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554 2708555

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10404181007 Result	Spike Conc.	Spike Conc.	Result								
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	19.9	20.4	99	102	75-137	3	30		
1,1,1-Trichloroethane	ug/L	<0.15	20	20	21.3	21.0	106	105	75-139	1	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	22.6	23.3	113	116	60-142	3	30		
1,1,2-Trichloroethane	ug/L	<0.22	20	20	20.2	20.3	101	102	75-128	1	30		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	19.9	20.0	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.2	19.3	96	96	70-129	0	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.3	20.2	101	101	67-141	0	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.9	20.0	99	100	64-144	1	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.0	21.8	105	109	66-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.9	21.4	105	107	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	20.0	20.4	100	102	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	55.2	56.3	110	113	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	19.5	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.3	20.9	102	104	68-135	3	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	18.6	18.9	93	94	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	39.2	38.8	98	97	69-134	1	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.6	20.6	103	103	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.5	21.0	103	105	64-146	2	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.8	20.6	99	103	69-135	4	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.3	19.5	96	97	67-128	1	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	20.6	99	103	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	399	392	100	98	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.1	16.9	81	85	48-150	5	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	17.5	17.1	88	85	50-150	2	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	115	116	115	116	58-125	1	30		
2-Chlorotoluene	ug/L	<0.20	20	20	20.0	20.5	100	103	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	119	120	119	120	61-134	1	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.2	20.0	96	100	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	115	117	115	117	61-130	2	30		
Acetone	ug/L	13.1J	100	100	160	164	147	151	51-140	2	30	M1	
Acrolein	ug/L	<4.8	200	200	198	205	99	103	48-150	3	30		
Acrylonitrile	ug/L	<4.9	200	200	212	214	106	107	55-134	1	30		
Benzene	ug/L	<0.13	20	20	19.4	19.0	97	95	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	19.4	20.3	97	101	67-138	5	30		
Bromochloromethane	ug/L	<0.38	20	20	19.0	19.1	95	95	66-138	1	30		
Bromodichloromethane	ug/L	<0.20	20	20	20.2	20.5	101	102	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	19.6	20.4	98	102	65-129	4	30		
Bromomethane	ug/L	<1.5	20	20	9.0	11.2	45	56	41-150	22	30	CL	
Carbon disulfide	ug/L	0.49J	20	20	17.9	17.6	87	85	72-132	2	30		
Carbon tetrachloride	ug/L	126	20	20	137	134	51	40	75-150	2	30	E,M1	
Chlorobenzene	ug/L	<0.14	20	20	20.2	20.6	101	103	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	20.8	22.1	104	110	74-138	6	30		
Chloroform	ug/L	9.5	20	20	27.6	27.3	91	89	74-125	1	30		
Chloromethane	ug/L	<1.1	20	20	17.7	18.5	89	93	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.4	19.1	97	96	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	18.8	18.9	94	94	66-129	1	30		
Dibromochloromethane	ug/L	<0.13	20	20	18.0	18.5	90	93	75-133	3	30		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<0.50	20	20	21.5	21.4	108	107	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.31	20	20	20.1	22.2	101	111	72-150	10	30		
Dichlorofluoromethane	ug/L	<0.38	20	20	17.9	18.7	89	94	75-129	5	30		
Diisopropyl ether	ug/L	<0.12	20	20	20.9	20.5	105	103	62-128	2	30		
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	18.8	18.6	94	93	63-132	1	30		
Ethylbenzene	ug/L	<0.14	20	20	20.2	20.5	101	102	72-130	1	30		
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	19.7	20.2	99	101	71-150	2	30		
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.0	20.5	100	103	70-136	3	30		
m&p-Xylene	ug/L	<0.24	40	40	40.9	41.5	102	104	64-142	2	30		
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.2	18.1	91	90	72-125	1	30		
Methylene Chloride	ug/L	<1.2	20	20	17.1	16.7	85	84	60-132	2	30		
n-Butylbenzene	ug/L	<0.13	20	20	20.4	21.0	102	105	60-150	3	30		
n-Propylbenzene	ug/L	<0.12	20	20	21.2	22.0	106	110	63-142	4	30		
Naphthalene	ug/L	<0.42	20	20	20.6	21.5	103	107	67-125	4	30		
o-Xylene	ug/L	<0.11	20	20	20.7	21.2	103	106	60-143	2	30		
p-Isopropyltoluene	ug/L	<0.14	20	20	18.7	19.2	94	96	64-146	3	30		
sec-Butylbenzene	ug/L	<0.12	20	20	20.5	21.2	103	106	67-144	3	30		
Styrene	ug/L	<0.14	20	20	18.1	18.4	90	92	67-136	2	30		
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.0	17.9	90	89	60-134	1	30		
tert-Butyl Alcohol	ug/L	<2.2	200	200	226	229	113	115	56-146	1	30		
tert-Butylbenzene	ug/L	<0.15	20	20	20.1	20.7	101	103	68-135	3	30		
Tetrachloroethene	ug/L	<0.16	20	20	19.4	20.0	97	100	67-148	3	30		
Tetrahydrofuran	ug/L	<4.3	200	200	230	240	115	120	51-141	4	30		
Toluene	ug/L	<0.17	20	20	19.4	19.8	97	99	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.8	19.7	99	98	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	17.3	17.7	87	89	67-134	2	30		
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	40.0	41.9	80	84	30-150	5	30		
Trichloroethene	ug/L	<0.18	20	20	22.0	21.8	110	109	64-149	1	30		
Trichlorofluoromethane	ug/L	<0.13	20	20	22.0	23.4	110	117	75-150	6	30		
Vinyl acetate	ug/L	<1.5	20	20	20.9	20.6	105	103	49-143	2	30		
Vinyl chloride	ug/L	<0.096	20	20	20.6	22.1	103	111	75-133	7	30		
Xylene (Total)	ug/L	<0.24	60	60	61.5	62.7	103	105	63-142	2	30		
1,2-Dichloroethane-d4 (S)	%						94	90	75-137				
4-Bromofluorobenzene (S)	%						97	98	75-125				
Toluene-d8 (S)	%						95	95	75-125				

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

QC Batch: 498365 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10403559001, 10403559002

METHOD BLANK: 2709355 Matrix: Water

Associated Lab Samples: 10403559001, 10403559002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/22/17 13:28	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/22/17 13:28	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/22/17 13:28	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/22/17 13:28	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/22/17 13:28	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/22/17 13:28	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/22/17 13:28	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/22/17 13:28	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/22/17 13:28	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/22/17 13:28	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/22/17 13:28	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/22/17 13:28	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/22/17 13:28	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/22/17 13:28	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/22/17 13:28	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/22/17 13:28	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/22/17 13:28	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/22/17 13:28	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/22/17 13:28	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/22/17 13:28	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/22/17 13:28	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/22/17 13:28	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/22/17 13:28	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/22/17 13:28	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/22/17 13:28	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/22/17 13:28	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/22/17 13:28	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/22/17 13:28	
Acetone	ug/L	<8.8	20.0	8.8	09/22/17 13:28	
Acrolein	ug/L	<4.8	10.0	4.8	09/22/17 13:28	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/22/17 13:28	
Benzene	ug/L	<0.13	0.50	0.13	09/22/17 13:28	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/22/17 13:28	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/22/17 13:28	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/22/17 13:28	
Bromoform	ug/L	<1.0	4.0	1.0	09/22/17 13:28	
Bromomethane	ug/L	<1.5	4.0	1.5	09/22/17 13:28	
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/22/17 13:28	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/22/17 13:28	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

METHOD BLANK: 2709355

Matrix: Water

Associated Lab Samples: 10403559001, 10403559002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
Chloroethane	ug/L	<0.44	1.0	0.44	09/22/17 13:28	
Chloroform	ug/L	<0.46	1.0	0.46	09/22/17 13:28	
Chloromethane	ug/L	<1.1	4.0	1.1	09/22/17 13:28	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/22/17 13:28	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/22/17 13:28	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/22/17 13:28	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/22/17 13:28	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/22/17 13:28	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/22/17 13:28	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/22/17 13:28	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/22/17 13:28	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/22/17 13:28	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/22/17 13:28	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/22/17 13:28	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/22/17 13:28	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/22/17 13:28	
Naphthalene	ug/L	<0.42	1.0	0.42	09/22/17 13:28	
o-Xylene	ug/L	<0.11	0.50	0.11	09/22/17 13:28	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/22/17 13:28	
Styrene	ug/L	<0.14	0.50	0.14	09/22/17 13:28	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/22/17 13:28	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/22/17 13:28	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/22/17 13:28	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/22/17 13:28	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/22/17 13:28	
Toluene	ug/L	<0.17	0.50	0.17	09/22/17 13:28	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/22/17 13:28	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/22/17 13:28	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/22/17 13:28	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/22/17 13:28	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/22/17 13:28	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/22/17 13:28	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/22/17 13:28	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/22/17 13:28	
1,2-Dichloroethane-d4 (S)	%	92	75-137		09/22/17 13:28	
4-Bromofluorobenzene (S)	%	90	75-125		09/22/17 13:28	
Toluene-d8 (S)	%	93	75-125		09/22/17 13:28	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

LABORATORY CONTROL SAMPLE: 2709356

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.4	102	75-136	
1,1,1-Trichloroethane	ug/L	20	19.4	97	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	24.2	121	71-138	
1,1,2-Trichloroethane	ug/L	20	21.5	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.1	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.5	93	75-125	
1,1-Dichloropropene	ug/L	20	17.5	88	75-125	
1,2,3-Trichlorobenzene	ug/L	20	22.6	113	75-125	
1,2,3-Trichloropropane	ug/L	20	23.6	118	75-125	
1,2,4-Trichlorobenzene	ug/L	20	22.9	114	75-125	
1,2,4-Trimethylbenzene	ug/L	20	20.0	100	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	60.2	120	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.1	100	75-125	
1,2-Dichlorobenzene	ug/L	20	22.2	111	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.6	94	75-125	
1,2-Dichloropropane	ug/L	20	20.2	101	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.3	102	75-125	
1,3-Dichlorobenzene	ug/L	20	21.3	107	75-125	
1,3-Dichloropropane	ug/L	20	20.2	101	75-125	
1,4-Dichlorobenzene	ug/L	20	21.1	106	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	376	94	64-140	
2,2,4-Trimethylpentane	ug/L	20	15.2	76	68-125	
2,2-Dichloropropane	ug/L	20	18.3	91	70-131	
2-Butanone (MEK)	ug/L	100	121	121	69-125	
2-Chlorotoluene	ug/L	20	20.4	102	75-125	
2-Hexanone	ug/L	100	126	126	73-129	
4-Chlorotoluene	ug/L	20	20.2	101	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	120	120	73-125	
Acetone	ug/L	100	115	115	66-126	
Acrolein	ug/L	200	230	115	56-150	
Acrylonitrile	ug/L	200	236	118	68-129	
Benzene	ug/L	20	18.4	92	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	20.0	100	75-133	
Bromoform	ug/L	20	20.9	104	62-142	
Bromomethane	ug/L	20	12.9	65	34-143	
Carbon disulfide	ug/L	20	16.1	81	71-125	
Carbon tetrachloride	ug/L	20	18.8	94	71-145	
Chlorobenzene	ug/L	20	20.7	104	75-125	
Chloroethane	ug/L	20	20.3	102	75-125	
Chloroform	ug/L	20	18.8	94	75-125	
Chloromethane	ug/L	20	17.1	85	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.8	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

LABORATORY CONTROL SAMPLE: 2709356

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.6	93	74-141	
Dibromomethane	ug/L	20	22.6	113	75-125	
Dichlorodifluoromethane	ug/L	20	19.1	96	59-130	
Dichlorofluoromethane	ug/L	20	18.0	90	75-125	
Diisopropyl ether	ug/L	20	20.5	103	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.8	94	73-125	
Ethylbenzene	ug/L	20	19.6	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.8	114	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.5	97	75-125	
m&p-Xylene	ug/L	40	40.8	102	75-125	
Methyl-tert-butyl ether	ug/L	20	18.9	94	75-125	
Methylene Chloride	ug/L	20	17.4	87	73-125	
n-Butylbenzene	ug/L	20	20.5	103	75-125	
n-Propylbenzene	ug/L	20	20.6	103	75-125	
Naphthalene	ug/L	20	21.6	108	74-125	
o-Xylene	ug/L	20	20.2	101	75-125	
p-Isopropyltoluene	ug/L	20	18.7	94	75-125	
sec-Butylbenzene	ug/L	20	19.8	99	75-125	
Styrene	ug/L	20	18.4	92	75-125	
tert-Amylmethyl ether	ug/L	20	18.7	94	71-126	
tert-Butyl Alcohol	ug/L	200	246	123	69-131	
tert-Butylbenzene	ug/L	20	19.7	99	75-125	
Tetrachloroethene	ug/L	20	19.6	98	75-125	
Tetrahydrofuran	ug/L	200	203	101	65-127	
Toluene	ug/L	20	19.8	99	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.8	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	18.0	90	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	46.6	93	30-150	
Trichloroethene	ug/L	20	20.9	105	75-125	
Trichlorofluoromethane	ug/L	20	20.9	104	71-140	
Vinyl acetate	ug/L	20	21.8	109	68-137	
Vinyl chloride	ug/L	20	19.8	99	70-125	
Xylene (Total)	ug/L	60	61.0	102	75-125	
1,2-Dichloroethane-d4 (S)	%			90	75-137	
4-Bromofluorobenzene (S)	%			95	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2709357 2709358

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10403491012	Spike Conc.	Spike Conc.	Result								
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	24.0	20.0	120	100	75-137	18	30		
1,1,1-Trichloroethane	ug/L	ND	20	20	24.9	21.1	125	105	75-139	17	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	27.1	23.8	135	119	60-142	13	30		
1,1,2-Trichloroethane	ug/L	ND	20	20	24.1	20.9	120	105	75-128	14	30		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

Parameter	Units	10403491012		2709357		2709358		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	25.1	21.4	125	107	62-150	16	30		
1,1-Dichloroethane	ug/L	ND	20	20	22.8	19.2	114	96	70-129	17	30		
1,1-Dichloroethene	ug/L	ND	20	20	24.9	21.0	124	105	67-141	17	30		
1,1-Dichloropropene	ug/L	ND	20	20	23.2	19.7	116	98	64-144	17	30		
1,2,3-Trichlorobenzene	ug/L	ND	20	20	27.7	23.2	139	116	66-139	18	30		
1,2,3-Trichloropropane	ug/L	ND	20	20	25.7	22.8	128	114	69-134	12	30		
1,2,4-Trichlorobenzene	ug/L	ND	20	20	28.4	23.3	142	116	65-138	20	30	M1	
1,2,4-Trimethylbenzene	ug/L	ND	20	20	24.8	20.9	124	105	65-143	17	30		
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	70.9	63.2	142	126	61-134	11	30	M1	
1,2-Dibromoethane (EDB)	ug/L	0.51	20	20	23.5	20.5	115	100	74-129	14	30		
1,2-Dichlorobenzene	ug/L	ND	20	20	25.0	21.4	125	107	68-135	16	30		
1,2-Dichloroethane	ug/L	ND	20	20	21.7	18.1	109	91	73-125	18	30		
1,2-Dichloroethene (Total)	ug/L	ND	40	40	47.8	40.8	119	102	69-134	16	30		
1,2-Dichloropropane	ug/L	ND	20	20	23.8	20.5	119	102	64-130	15	30		
1,3,5-Trimethylbenzene	ug/L	ND	20	20	25.4	21.3	127	107	64-146	17	30		
1,3-Dichlorobenzene	ug/L	ND	20	20	24.2	21.2	121	106	69-135	13	30		
1,3-Dichloropropane	ug/L	ND	20	20	22.3	19.3	111	96	67-128	14	30		
1,4-Dichlorobenzene	ug/L	ND	20	20	24.8	21.2	124	106	66-134	15	30		
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	486	419	122	105	58-140	15	30		
2,2,4-Trimethylpentane	ug/L	ND	20	20	25.3	19.3	127	97	48-150	27	30		
2,2-Dichloropropane	ug/L	ND	20	20	23.1	19.8	116	99	50-150	15	30		
2-Butanone (MEK)	ug/L	ND	100	100	136	125	136	125	58-125	8	30	M1	
2-Chlorotoluene	ug/L	ND	20	20	23.5	20.6	118	103	65-138	13	30		
2-Hexanone	ug/L	ND	100	100	139	127	139	127	61-134	9	30	M1	
4-Chlorotoluene	ug/L	ND	20	20	23.2	20.3	116	101	68-135	13	30		
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	135	120	135	120	61-130	11	30	M1	
Acetone	ug/L	ND	100	100	161	143	156	138	51-140	12	30	M1	
Acrolein	ug/L	ND	200	200	323	286	162	143	48-150	12	30	M1	
Acrylonitrile	ug/L	ND	200	200	259	227	130	113	55-134	13	30		
Benzene	ug/L	ND	20	20	22.4	19.2	112	96	63-132	15	30		
Bromobenzene	ug/L	ND	20	20	23.9	21.0	119	105	67-138	13	30		
Bromochloromethane	ug/L	ND	20	20	22.3	19.8	112	99	66-138	12	30		
Bromodichloromethane	ug/L	ND	20	20	23.9	20.2	120	101	75-137	17	30		
Bromoform	ug/L	ND	20	20	24.1	21.1	121	106	65-129	13	30		
Bromomethane	ug/L	ND	20	20	9.2	14.8	46	74	41-150	47	30	R1	
Carbon disulfide	ug/L	ND	20	20	22.0	17.9	110	90	72-132	20	30		
Carbon tetrachloride	ug/L	ND	20	20	24.3	20.2	121	101	75-150	18	30		
Chlorobenzene	ug/L	ND	20	20	23.3	20.3	116	101	73-127	14	30		
Chloroethane	ug/L	ND	20	20	13.6	19.8	68	99	74-138	37	30	M1,R1	
Chloroform	ug/L	ND	20	20	21.4	18.8	107	94	74-125	13	30		
Chloromethane	ug/L	ND	20	20	11.6	16.6	58	83	58-129	35	30	R1	
cis-1,2-Dichloroethene	ug/L	ND	20	20	23.1	19.8	116	99	63-135	15	30		
cis-1,3-Dichloropropene	ug/L	ND	20	20	22.9	19.1	115	95	66-129	18	30		
Dibromochloromethane	ug/L	ND	20	20	21.7	18.9	108	95	75-133	13	30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2709357												2709358	
Parameter	Units	10403491012 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD			
Dibromomethane	ug/L	ND	20	20	26.3	22.9	131	114	68-134	14	30		
Dichlorodifluoromethane	ug/L	ND	20	20	14.3	20.8	71	104	72-150	38	30	M1,R1	
Dichlorofluoromethane	ug/L	ND	20	20	11.6	17.5	58	87	75-129	40	30	M1,R1	
Diisopropyl ether	ug/L	ND	20	20	23.7	20.7	119	103	62-128	14	30		
Ethyl-tert-butyl ether	ug/L	ND	20	20	21.7	19.1	108	96	63-132	12	30		
Ethylbenzene	ug/L	ND	20	20	23.8	20.7	119	104	72-130	14	30		
Hexachloro-1,3-butadiene	ug/L	ND	20	20	33.0	24.3	165	121	71-150	31	30	M1,R1	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	23.8	20.5	119	103	70-136	15	30		
m&p-Xylene	ug/L	ND	40	40	48.3	41.8	121	105	64-142	14	30		
Methyl-tert-butyl ether	ug/L	ND	20	20	21.7	19.1	109	95	72-125	13	30		
Methylene Chloride	ug/L	ND	20	20	20.5	17.2	102	86	60-132	17	30		
n-Butylbenzene	ug/L	ND	20	20	28.4	22.6	142	113	60-150	23	30		
n-Propylbenzene	ug/L	ND	20	20	25.9	21.9	129	110	63-142	17	30		
Naphthalene	ug/L	ND	20	20	25.7	23.0	128	115	67-125	11	30	M1	
o-Xylene	ug/L	ND	20	20	24.1	21.2	121	106	60-143	13	30		
p-Isopropyltoluene	ug/L	ND	20	20	24.7	20.4	124	102	64-146	19	30		
sec-Butylbenzene	ug/L	ND	20	20	26.6	21.9	133	110	67-144	19	30		
Styrene	ug/L	ND	20	20	21.8	19.0	109	95	67-136	14	30		
tert-Amylmethyl ether	ug/L	ND	20	20	20.8	18.1	104	91	60-134	14	30		
tert-Butyl Alcohol	ug/L	ND	200	200	258	243	129	122	56-146	6	30		
tert-Butylbenzene	ug/L	ND	20	20	25.3	21.5	126	107	68-135	16	30		
Tetrachloroethene	ug/L	ND	20	20	24.0	21.4	120	107	67-148	11	30		
Tetrahydrofuran	ug/L	ND	200	200	290	250	145	125	51-141	15	30	M1	
Toluene	ug/L	ND	20	20	23.2	20.2	116	101	61-140	14	30		
trans-1,2-Dichloroethene	ug/L	ND	20	20	24.7	21.0	123	105	62-138	16	30		
trans-1,3-Dichloropropene	ug/L	ND	20	20	21.1	18.2	105	91	67-134	14	30		
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	53.8	45.6	108	91	30-150	17	30		
Trichloroethene	ug/L	ND	20	20	26.6	22.8	133	114	64-149	16	30		
Trichlorofluoromethane	ug/L	ND	20	20	15.0	22.1	75	111	75-150	38	30	R1	
Vinyl acetate	ug/L	ND	20	20	25.5	21.9	127	109	49-143	15	30		
Vinyl chloride	ug/L	ND	20	20	13.5	20.3	68	102	75-133	40	30	M1,R1	
Xylene (Total)	ug/L	ND	60	60	72.4	63.0	121	105	63-142	14	30		
1,2-Dichloroethane-d4 (S)	%						91	89	75-137				
4-Bromofluorobenzene (S)	%						96	96	75-125				
Toluene-d8 (S)	%						93	92	75-125				

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**REPORT OF LABORATORY ANALYSIS**

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

R1 RPD value was outside control limits.

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403559

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

---

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403559

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10403559001	Lashaw-AG-GW-091217	EPA 8260B	498365		
10403559002	Lashaw-Dom-GW-091217	EPA 8260B	498365		
10403559003	TB-091217	EPA 8260B	498194		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403559

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	
Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR	
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221	Regulatory Agency
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938	State / Location
Fax:	Project Name: Freeman WA-Grain Handling Facility	Pace Project Manager: Jennifer Gross	WA / Freeman
Requested Due Date: <b>10 Day Standard</b>	Project #: 1497	Pace Profile #: 36447 / 4	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Analyses Test	Requested Analysis Filtered (Y/N)																		
				START DATE	END DATE			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other			Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5810	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2	MS/MSD Requested								
																DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE
1	Lashaw-AG-GW-091217	WT G			09/12/17	1218	3					X			X																			
2	Lashaw-Dom-GW-091217	WT G			1	1140	3					X			X																			
3	TB-091217	WT G			1	0700	2					X			X																			
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

001  
002  
Trip Blank 003

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	ZK/S/CH2M	9-15-17	1130		9/16/17	0855	2.4 3.4 3.9 6.7 5.4
*Field filtered by client							


SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: L K Baumann	SIGNATURE of SAMPLER:					
		DATE Signed: 9-15-17				

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name:  
**CH2M Hill**

Project #:

**NO# : 10403559**



10403559

Optional: Proj. Due Date: Proj. Name:

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other:

Tracking Number: **702145755372, 702145755381, 702145755418,**  
**7021457553780, 7021457553472**

Custody Seal on Cooler/Box Present?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: **PS**

Thermometer  151401163

Used:  G87A9155100842

Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **22.30, 4.1/1.1, 5.9** Cooler Temp Corrected (°C): **2.4, 3.4, 3.9, 0.7, 5.4** Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: **0.2, -0.5** Date and Initials of Person Examining Contents: **09/16/17**

USDA Regulated Soil  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix:	<b>WT</b>	
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <b>sample -001 3/5 06914, triplets 6 7/4 06917</b>
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<b>Shaded trip blank</b>
Pace Trip Blank Lot # (if purchased):	<b>N/A</b>	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: **CH2M Hill Staff**

Field Data Required?  Yes  No  
 Date/Time: **9/18/17**

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1355</b>	Temp: <b>2.2, 3.0, 4.1</b>	Corrected: <b>2.4, 3.4</b>
Time: <b>1410</b>	put in cooler	Temp: <b>3.9, 0.7</b>
Time:	Temp:	Corrected Temp:

Notified of headspace.

Project Manager Review:

**Amanda J. Albrecht**

Date: **9/18/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 22, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

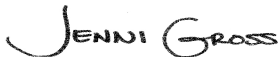
RE: Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403560

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403560001	ASHER-GW-091217	Water	09/12/17 15:20	09/16/17 08:55
10403560003	TB-091217	Water	09/12/17 00:00	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403560

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403560001	ASHER-GW-091217	EPA 8260B	DJB	83	PASI-M
10403560003	TB-091217	EPA 8260B	DJB	83	PASI-M

**REPORT OF LABORATORY ANALYSIS**

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403560001</b>	<b>ASHER-GW-091217</b>					
EPA 8260B	Acetone	44.5	ug/L	20.0	09/22/17 04:11	
<b>10403560003</b>	<b>TB-091217</b>					
EPA 8260B	Acetone	15.9J	ug/L	20.0	09/22/17 00:08	
EPA 8260B	tert-Butyl Alcohol	7.5J	ug/L	10.0	09/22/17 00:08	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 498194

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- ASHER-GW-091217 (Lab ID: 10403560001)
  - Bromomethane
- BLANK (Lab ID: 2708552)
  - Bromomethane
- LCS (Lab ID: 2708553)
  - Bromomethane
- MS (Lab ID: 2708554)
  - Bromomethane
- MSD (Lab ID: 2708555)
  - Bromomethane
- TB-091217 (Lab ID: 10403560003)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

QC Batch: 498194

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404181007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708554)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Acetone
  - Carbon tetrachloride

### Additional Comments:

Analyte Comments:

QC Batch: 498194

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2708554)
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Carbon tetrachloride

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Sample: ASHER-GW-091217 Lab ID: 10403560001 Collected: 09/12/17 15:20 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 04:11	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 04:11	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 04:11	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 04:11	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 04:11	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:11	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:11	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 04:11	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:11	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 04:11	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 04:11	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 04:11	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 04:11	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 04:11	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 04:11	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 04:11	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:11	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:11	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 04:11	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 04:11	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 04:11	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 04:11	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 04:11	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 04:11	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 04:11	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 04:11	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:11	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 04:11	108-10-1	
Acetone	44.5	ug/L	20.0	8.8	1		09/22/17 04:11	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 04:11	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 04:11	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:11	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:11	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 04:11	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 04:11	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 04:11	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 04:11	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 04:11	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/22/17 04:11	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 04:11	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 04:11	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 04:11	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 04:11	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

**Sample:** ASHER-GW-091217      **Lab ID:** 10403560001      Collected: 09/12/17 15:20      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 04:11	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 04:11	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 04:11	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 04:11	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 04:11	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 04:11	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 04:11	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 04:11	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:11	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 04:11	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 04:11	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 04:11	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 04:11	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 04:11	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 04:11	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 04:11	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 04:11	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:11	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 04:11	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:11	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:11	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 04:11	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:11	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:11	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 04:11	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 04:11	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 04:11	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 04:11	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 04:11	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 04:11	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 04:11	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		09/22/17 04:11	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1		09/22/17 04:11	460-00-4	

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Sample: TB-091217 Lab ID: 10403560003 Collected: 09/12/17 00:00 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 00:08	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 00:08	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 00:08	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 00:08	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 00:08	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 00:08	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 00:08	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 00:08	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 00:08	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 00:08	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 00:08	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 00:08	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 00:08	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 00:08	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 00:08	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 00:08	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 00:08	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 00:08	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 00:08	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 00:08	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 00:08	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 00:08	108-10-1	
Acetone	15.9J	ug/L	20.0	8.8	1		09/22/17 00:08	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 00:08	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 00:08	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 00:08	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 00:08	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 00:08	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 00:08	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 00:08	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 00:08	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 00:08	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 00:08	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 00:08	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

**Sample:** TB-091217      **Lab ID:** 10403560003      Collected: 09/12/17 00:00      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 00:08	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 00:08	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 00:08	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 00:08	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 00:08	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 00:08	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 00:08	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 00:08	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 00:08	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 00:08	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 00:08	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 00:08	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 00:08	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 00:08	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 00:08	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 00:08	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 00:08	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 00:08	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 00:08	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 00:08	994-05-8	
tert-Butyl Alcohol	7.5J	ug/L	10.0	2.2	1		09/22/17 00:08	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 00:08	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 00:08	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 00:08	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 00:08	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 00:08	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		09/22/17 00:08	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		09/22/17 00:08	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

QC Batch: 498194 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10403560001, 10403560003

METHOD BLANK: 2708552 Matrix: Water

Associated Lab Samples: 10403560001, 10403560003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/21/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/21/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/21/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/21/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/21/17 23:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/21/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/21/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/21/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/21/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/21/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/21/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/21/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/21/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/21/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	09/21/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	09/21/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/21/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	09/21/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/21/17 23:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/21/17 23:24	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403560001, 10403560003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	09/21/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	09/21/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	09/21/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/21/17 23:24	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/21/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/21/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/21/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/21/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/21/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/21/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	09/21/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	09/21/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Styrene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/21/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/21/17 23:24	
Toluene	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/21/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/21/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/21/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/21/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/21/17 23:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		09/21/17 23:24	
4-Bromofluorobenzene (S)	%	100	75-125		09/21/17 23:24	
Toluene-d8 (S)	%	95	75-125		09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-136	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	23.3	116	71-138	
1,1,2-Trichloroethane	ug/L	20	21.4	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.1	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,3-Trichloropropane	ug/L	20	22.3	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.2	106	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	93	75-125	
1,2-Dichloropropane	ug/L	20	20.0	100	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	390	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	13.7	69	68-125	
2,2-Dichloropropane	ug/L	20	16.5	82	70-131	
2-Butanone (MEK)	ug/L	100	113	113	69-125	
2-Chlorotoluene	ug/L	20	19.9	99	75-125	
2-Hexanone	ug/L	100	121	121	73-129	
4-Chlorotoluene	ug/L	20	19.7	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	116	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	231	115	68-129	
Benzene	ug/L	20	18.5	92	75-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	19.9	100	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	7.2	36	34-143	CL
Carbon disulfide	ug/L	20	16.6	83	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	20.9	104	75-125	
Chloroethane	ug/L	20	20.9	104	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	17.5	88	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403560

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.7	94	74-141	
Dibromomethane	ug/L	20	22.1	110	75-125	
Dichlorodifluoromethane	ug/L	20	19.0	95	59-130	
Dichlorofluoromethane	ug/L	20	17.9	89	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.6	93	73-125	
Ethylbenzene	ug/L	20	19.7	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.4	97	75-125	
m&p-Xylene	ug/L	40	40.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	18.5	93	75-125	
Methylene Chloride	ug/L	20	17.3	86	73-125	
n-Butylbenzene	ug/L	20	19.1	96	75-125	
n-Propylbenzene	ug/L	20	19.9	100	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	19.9	100	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	19.2	96	75-125	
Styrene	ug/L	20	18.2	91	75-125	
tert-Amylmethyl ether	ug/L	20	18.6	93	71-126	
tert-Butyl Alcohol	ug/L	200	243	121	69-131	
tert-Butylbenzene	ug/L	20	19.0	95	75-125	
Tetrachloroethene	ug/L	20	19.0	95	75-125	
Tetrahydrofuran	ug/L	200	204	102	65-127	
Toluene	ug/L	20	19.6	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.6	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.6	88	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.0	80	30-150	
Trichloroethene	ug/L	20	20.3	101	75-125	
Trichlorofluoromethane	ug/L	20	20.6	103	71-140	
Vinyl acetate	ug/L	20	22.8	114	68-137	
Vinyl chloride	ug/L	20	19.6	98	70-125	
Xylene (Total)	ug/L	60	59.9	100	75-125	
1,2-Dichloroethane-d4 (S)	%			89	75-137	
4-Bromofluorobenzene (S)	%			96	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554 2708555

Parameter	Units	10404181007		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	20	19.9	20.4	99	102	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	20	20	21.3	21.0	106	105	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	20	22.6	23.3	113	116	60-142	3	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20	20	20.2	20.3	101	102	75-128	1	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	19.9	20.0	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.2	19.3	96	96	70-129	0	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.3	20.2	101	101	67-141	0	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.9	20.0	99	100	64-144	1	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.0	21.8	105	109	66-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.9	21.4	105	107	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	20.0	20.4	100	102	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	55.2	56.3	110	113	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	19.5	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.3	20.9	102	104	68-135	3	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	18.6	18.9	93	94	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	39.2	38.8	98	97	69-134	1	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.6	20.6	103	103	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.5	21.0	103	105	64-146	2	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.8	20.6	99	103	69-135	4	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.3	19.5	96	97	67-128	1	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	20.6	99	103	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	399	392	100	98	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.1	16.9	81	85	48-150	5	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	17.5	17.1	88	85	50-150	2	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	115	116	115	116	58-125	1	30		
2-Chlorotoluene	ug/L	<0.20	20	20	20.0	20.5	100	103	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	119	120	119	120	61-134	1	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.2	20.0	96	100	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	115	117	115	117	61-130	2	30		
Acetone	ug/L	13.1J	100	100	160	164	147	151	51-140	2	30	M1	
Acrolein	ug/L	<4.8	200	200	198	205	99	103	48-150	3	30		
Acrylonitrile	ug/L	<4.9	200	200	212	214	106	107	55-134	1	30		
Benzene	ug/L	<0.13	20	20	19.4	19.0	97	95	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	19.4	20.3	97	101	67-138	5	30		
Bromochloromethane	ug/L	<0.38	20	20	19.0	19.1	95	95	66-138	1	30		
Bromodichloromethane	ug/L	<0.20	20	20	20.2	20.5	101	102	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	19.6	20.4	98	102	65-129	4	30		
Bromomethane	ug/L	<1.5	20	20	9.0	11.2	45	56	41-150	22	30	CL	
Carbon disulfide	ug/L	0.49J	20	20	17.9	17.6	87	85	72-132	2	30		
Carbon tetrachloride	ug/L	126	20	20	137	134	51	40	75-150	2	30	E,M1	
Chlorobenzene	ug/L	<0.14	20	20	20.2	20.6	101	103	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	20.8	22.1	104	110	74-138	6	30		
Chloroform	ug/L	9.5	20	20	27.6	27.3	91	89	74-125	1	30		
Chloromethane	ug/L	<1.1	20	20	17.7	18.5	89	93	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.4	19.1	97	96	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	18.8	18.9	94	94	66-129	1	30		
Dibromochloromethane	ug/L	<0.13	20	20	18.0	18.5	90	93	75-133	3	30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.50	20	20	21.5	21.4	108	107	68-134	1	30	
Dichlorodifluoromethane	ug/L	<0.31	20	20	20.1	22.2	101	111	72-150	10	30	
Dichlorofluoromethane	ug/L	<0.38	20	20	17.9	18.7	89	94	75-129	5	30	
Diisopropyl ether	ug/L	<0.12	20	20	20.9	20.5	105	103	62-128	2	30	
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	18.8	18.6	94	93	63-132	1	30	
Ethylbenzene	ug/L	<0.14	20	20	20.2	20.5	101	102	72-130	1	30	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	19.7	20.2	99	101	71-150	2	30	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.0	20.5	100	103	70-136	3	30	
m&p-Xylene	ug/L	<0.24	40	40	40.9	41.5	102	104	64-142	2	30	
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.2	18.1	91	90	72-125	1	30	
Methylene Chloride	ug/L	<1.2	20	20	17.1	16.7	85	84	60-132	2	30	
n-Butylbenzene	ug/L	<0.13	20	20	20.4	21.0	102	105	60-150	3	30	
n-Propylbenzene	ug/L	<0.12	20	20	21.2	22.0	106	110	63-142	4	30	
Naphthalene	ug/L	<0.42	20	20	20.6	21.5	103	107	67-125	4	30	
o-Xylene	ug/L	<0.11	20	20	20.7	21.2	103	106	60-143	2	30	
p-Isopropyltoluene	ug/L	<0.14	20	20	18.7	19.2	94	96	64-146	3	30	
sec-Butylbenzene	ug/L	<0.12	20	20	20.5	21.2	103	106	67-144	3	30	
Styrene	ug/L	<0.14	20	20	18.1	18.4	90	92	67-136	2	30	
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.0	17.9	90	89	60-134	1	30	
tert-Butyl Alcohol	ug/L	<2.2	200	200	226	229	113	115	56-146	1	30	
tert-Butylbenzene	ug/L	<0.15	20	20	20.1	20.7	101	103	68-135	3	30	
Tetrachloroethene	ug/L	<0.16	20	20	19.4	20.0	97	100	67-148	3	30	
Tetrahydrofuran	ug/L	<4.3	200	200	230	240	115	120	51-141	4	30	
Toluene	ug/L	<0.17	20	20	19.4	19.8	97	99	61-140	2	30	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.8	19.7	99	98	62-138	1	30	
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	17.3	17.7	87	89	67-134	2	30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	40.0	41.9	80	84	30-150	5	30	
Trichloroethene	ug/L	<0.18	20	20	22.0	21.8	110	109	64-149	1	30	
Trichlorofluoromethane	ug/L	<0.13	20	20	22.0	23.4	110	117	75-150	6	30	
Vinyl acetate	ug/L	<1.5	20	20	20.9	20.6	105	103	49-143	2	30	
Vinyl chloride	ug/L	<0.096	20	20	20.6	22.1	103	111	75-133	7	30	
Xylene (Total)	ug/L	<0.24	60	60	61.5	62.7	103	105	63-142	2	30	
1,2-Dichloroethane-d4 (S)	%						94	90	75-137			
4-Bromofluorobenzene (S)	%						97	98	75-125			
Toluene-d8 (S)	%						95	95	75-125			

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403560

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10403560001	ASHER-GW-091217	EPA 8260B	498194		
10403560003	TB-091217	EPA 8260B	498194		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403560

**Section A**

**Section B**

**Section C**

Required Client Information:

Required Project Information:

Invoice Information:

Page: 1 of 1

<b>Company:</b> UPRR	<b>Report To:</b> Mark Ochsner, Brad Ostapkowicz	<b>Attention:</b> Anne Theriault (atheria@up.com)
<b>Address:</b> 1400 W. 52nd Ave. Denver, CO 80221	<b>Copy To:</b> Steve Demus, Lindsey Baumann	<b>Company:</b> UPRR
<b>Email:</b> atheria@up.com	<b>Copy To:</b> David Hodson, UPRR-Sysdat@ghd.com	<b>Address:</b> 1400 W. 52nd Ave, Denver, CO 80221
<b>Phone:</b>	<b>Purchase Order #</b>	<b>Pace Quote:</b> Contract# 758938
<b>Requested Due Date:</b> 24 Hr / 3 Day / <b>10 Day</b>	<b>Project Name:</b> Freeman, WA - Cenex Harvest Lease	<b>Pace Project Manager:</b> Jennifer Gross
	<b>Project #:</b>	<b>Pace Profile #:</b> 36447 / 4

<b>Regulatory Agency</b>
<b>State / Location</b>
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipes Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Requested Analysis Filtered (Y/N)						
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Y/N	Y	Y				
						DATE	TIME	DATE	TIME														Low Level VOCs by 8260	6020 Total Iron	6020 Dissolved Iron (Field Filtered)
1	ASHER-GW-091217			WTG				9/12/17	1520	3								X						001	
2	TB-091217			WTG				9/12/17	0700	2								X							Trip Blank
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS							
*Field filtered by client	[Signature] / CH2M	9-15-17	1147	[Signature]	9/16/17	855	2-4	3-4	2-7	6-7	5-4	Y	Y	Y

<b>SAMPLER NAME AND SIGNATURE</b>		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: L K Baumann	SIGNATURE of SAMPLER: [Signature]					
DATE Signed: 9-15-17						





Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.23**

Document Revised: 30Aug2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

Sample Condition  
 Upon Receipt - ESI  
 Tech Specs

Client Name: VPRR  
 Project #:

**WO# : 10403560**  
  
 10403560  
 Optional: Proj. Due Date: Proj. Name:

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other:  
 Tracking Number: 702145755372, 702145755381, 702145755418,  
702145753780, 702145753943  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS  
 Temp Blank?  Yes  No  
 Thermometer Used:  151401163  G87A9155100842  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 2.2, 3.0, 4.1, 1.2 Cooler Temp Corrected (°C): 2.4, 3.4, 3.9, 0.7, 5.4  
 Biological Tissue Frozen?  Yes  No  NA  
 Correction Factor: 1.2, 1.3 Date and Initials of Person Examining Contents: 9/16/17

USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	12.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>All vials trip blank 1/4 vials</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Should trip blanks 10403559</u>
Pace Trip Blank Lot # (if purchased): <u>N/A</u>	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: CH2M Hill Staff Date/Time: 9/18/17  
 Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	Notified of headspace.
Opened Time: <u>1355</u> Temp: <u>2.2, 3.0, 4.1</u> Corrected Temp: <u>2.4, 3.4</u>	
Time: <u>1410</u> put in cooler Temp: <u>1.2, 5.7</u> Corrected Temp: <u>3.9, 6.7</u>	
Time: Temp: <u>5.4</u> Corrected Temp:	

Project Manager Review: Amanda J Albrecht Date: 9/18/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 22, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

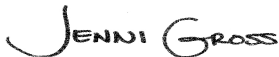
RE: Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403561

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403561001	STARK-GW-091217	Water	09/12/17 14:54	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

---

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403561001	STARK-GW-091217	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403561001</b>	<b>STARK-GW-091217</b>					
EPA 8260B	Acetone	22.1	ug/L	20.0	09/22/17 04:33	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

---

**Date:** September 22, 2017

The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 498194

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2708552)
  - Bromomethane
- LCS (Lab ID: 2708553)
  - Bromomethane
- MS (Lab ID: 2708554)
  - Bromomethane
- MSD (Lab ID: 2708555)
  - Bromomethane
- STARK-GW-091217 (Lab ID: 10403561001)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

QC Batch: 498194

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404181007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708554)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Acetone
  - Carbon tetrachloride

### Additional Comments:

Analyte Comments:

QC Batch: 498194

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2708554)
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Carbon tetrachloride

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

Sample: **STARK-GW-091217** Lab ID: **10403561001** Collected: 09/12/17 14:54 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 04:33	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 04:33	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 04:33	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 04:33	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 04:33	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:33	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:33	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 04:33	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:33	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 04:33	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 04:33	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 04:33	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 04:33	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 04:33	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 04:33	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 04:33	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:33	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:33	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 04:33	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 04:33	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 04:33	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 04:33	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 04:33	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 04:33	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 04:33	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 04:33	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:33	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 04:33	108-10-1	
Acetone	22.1	ug/L	20.0	8.8	1		09/22/17 04:33	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 04:33	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 04:33	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:33	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:33	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 04:33	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 04:33	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 04:33	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 04:33	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 04:33	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/22/17 04:33	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 04:33	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 04:33	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 04:33	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 04:33	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

**Sample: STARK-GW-091217**      **Lab ID: 10403561001**      Collected: 09/12/17 14:54      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 04:33	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 04:33	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 04:33	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 04:33	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 04:33	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 04:33	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 04:33	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 04:33	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:33	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 04:33	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 04:33	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 04:33	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 04:33	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 04:33	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 04:33	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 04:33	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 04:33	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:33	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 04:33	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:33	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:33	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 04:33	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:33	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:33	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 04:33	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 04:33	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 04:33	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 04:33	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 04:33	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 04:33	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 04:33	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		09/22/17 04:33	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		09/22/17 04:33	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403561

QC Batch: 498194 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10403561001

METHOD BLANK: 2708552 Matrix: Water  
Associated Lab Samples: 10403561001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/21/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/21/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/21/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/21/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/21/17 23:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/21/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/21/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/21/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/21/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/21/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/21/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/21/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/21/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/21/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	09/21/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	09/21/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/21/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	09/21/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/21/17 23:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403561001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	09/21/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	09/21/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	09/21/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/21/17 23:24	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/21/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/21/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/21/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/21/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/21/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/21/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	09/21/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	09/21/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Styrene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/21/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/21/17 23:24	
Toluene	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/21/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/21/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/21/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/21/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/21/17 23:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		09/21/17 23:24	
4-Bromofluorobenzene (S)	%	100	75-125		09/21/17 23:24	
Toluene-d8 (S)	%	95	75-125		09/21/17 23:24	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403561

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-136	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	23.3	116	71-138	
1,1,2-Trichloroethane	ug/L	20	21.4	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.1	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,3-Trichloropropane	ug/L	20	22.3	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.2	106	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	93	75-125	
1,2-Dichloropropane	ug/L	20	20.0	100	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	390	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	13.7	69	68-125	
2,2-Dichloropropane	ug/L	20	16.5	82	70-131	
2-Butanone (MEK)	ug/L	100	113	113	69-125	
2-Chlorotoluene	ug/L	20	19.9	99	75-125	
2-Hexanone	ug/L	100	121	121	73-129	
4-Chlorotoluene	ug/L	20	19.7	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	116	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	231	115	68-129	
Benzene	ug/L	20	18.5	92	75-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	19.9	100	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	7.2	36	34-143	CL
Carbon disulfide	ug/L	20	16.6	83	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	20.9	104	75-125	
Chloroethane	ug/L	20	20.9	104	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	17.5	88	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403561

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.7	94	74-141	
Dibromomethane	ug/L	20	22.1	110	75-125	
Dichlorodifluoromethane	ug/L	20	19.0	95	59-130	
Dichlorofluoromethane	ug/L	20	17.9	89	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.6	93	73-125	
Ethylbenzene	ug/L	20	19.7	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.4	97	75-125	
m&p-Xylene	ug/L	40	40.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	18.5	93	75-125	
Methylene Chloride	ug/L	20	17.3	86	73-125	
n-Butylbenzene	ug/L	20	19.1	96	75-125	
n-Propylbenzene	ug/L	20	19.9	100	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	19.9	100	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	19.2	96	75-125	
Styrene	ug/L	20	18.2	91	75-125	
tert-Amylmethyl ether	ug/L	20	18.6	93	71-126	
tert-Butyl Alcohol	ug/L	200	243	121	69-131	
tert-Butylbenzene	ug/L	20	19.0	95	75-125	
Tetrachloroethene	ug/L	20	19.0	95	75-125	
Tetrahydrofuran	ug/L	200	204	102	65-127	
Toluene	ug/L	20	19.6	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.6	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.6	88	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.0	80	30-150	
Trichloroethene	ug/L	20	20.3	101	75-125	
Trichlorofluoromethane	ug/L	20	20.6	103	71-140	
Vinyl acetate	ug/L	20	22.8	114	68-137	
Vinyl chloride	ug/L	20	19.6	98	70-125	
Xylene (Total)	ug/L	60	59.9	100	75-125	
1,2-Dichloroethane-d4 (S)	%			89	75-137	
4-Bromofluorobenzene (S)	%			96	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554 2708555

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10404181007 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	19.9	20.4	99	102	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	20	21.3	21.0	106	105	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	22.6	23.3	113	116	60-142	3	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20	20.2	20.3	101	102	75-128	1	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	19.9	20.0	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.2	19.3	96	96	70-129	0	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.3	20.2	101	101	67-141	0	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.9	20.0	99	100	64-144	1	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.0	21.8	105	109	66-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.9	21.4	105	107	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	20.0	20.4	100	102	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	55.2	56.3	110	113	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	19.5	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.3	20.9	102	104	68-135	3	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	18.6	18.9	93	94	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	39.2	38.8	98	97	69-134	1	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.6	20.6	103	103	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.5	21.0	103	105	64-146	2	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.8	20.6	99	103	69-135	4	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.3	19.5	96	97	67-128	1	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	20.6	99	103	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	399	392	100	98	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.1	16.9	81	85	48-150	5	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	17.5	17.1	88	85	50-150	2	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	115	116	115	116	58-125	1	30		
2-Chlorotoluene	ug/L	<0.20	20	20	20.0	20.5	100	103	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	119	120	119	120	61-134	1	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.2	20.0	96	100	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	115	117	115	117	61-130	2	30		
Acetone	ug/L	13.1J	100	100	160	164	147	151	51-140	2	30	M1	
Acrolein	ug/L	<4.8	200	200	198	205	99	103	48-150	3	30		
Acrylonitrile	ug/L	<4.9	200	200	212	214	106	107	55-134	1	30		
Benzene	ug/L	<0.13	20	20	19.4	19.0	97	95	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	19.4	20.3	97	101	67-138	5	30		
Bromochloromethane	ug/L	<0.38	20	20	19.0	19.1	95	95	66-138	1	30		
Bromodichloromethane	ug/L	<0.20	20	20	20.2	20.5	101	102	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	19.6	20.4	98	102	65-129	4	30		
Bromomethane	ug/L	<1.5	20	20	9.0	11.2	45	56	41-150	22	30	CL	
Carbon disulfide	ug/L	0.49J	20	20	17.9	17.6	87	85	72-132	2	30		
Carbon tetrachloride	ug/L	126	20	20	137	134	51	40	75-150	2	30	E,M1	
Chlorobenzene	ug/L	<0.14	20	20	20.2	20.6	101	103	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	20.8	22.1	104	110	74-138	6	30		
Chloroform	ug/L	9.5	20	20	27.6	27.3	91	89	74-125	1	30		
Chloromethane	ug/L	<1.1	20	20	17.7	18.5	89	93	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.4	19.1	97	96	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	18.8	18.9	94	94	66-129	1	30		
Dibromochloromethane	ug/L	<0.13	20	20	18.0	18.5	90	93	75-133	3	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.									
Dibromomethane	ug/L	<0.50	20	20	21.5	21.4	108	107	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.31	20	20	20.1	22.2	101	111	72-150	10	30		
Dichlorofluoromethane	ug/L	<0.38	20	20	17.9	18.7	89	94	75-129	5	30		
Diisopropyl ether	ug/L	<0.12	20	20	20.9	20.5	105	103	62-128	2	30		
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	18.8	18.6	94	93	63-132	1	30		
Ethylbenzene	ug/L	<0.14	20	20	20.2	20.5	101	102	72-130	1	30		
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	19.7	20.2	99	101	71-150	2	30		
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.0	20.5	100	103	70-136	3	30		
m&p-Xylene	ug/L	<0.24	40	40	40.9	41.5	102	104	64-142	2	30		
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.2	18.1	91	90	72-125	1	30		
Methylene Chloride	ug/L	<1.2	20	20	17.1	16.7	85	84	60-132	2	30		
n-Butylbenzene	ug/L	<0.13	20	20	20.4	21.0	102	105	60-150	3	30		
n-Propylbenzene	ug/L	<0.12	20	20	21.2	22.0	106	110	63-142	4	30		
Naphthalene	ug/L	<0.42	20	20	20.6	21.5	103	107	67-125	4	30		
o-Xylene	ug/L	<0.11	20	20	20.7	21.2	103	106	60-143	2	30		
p-Isopropyltoluene	ug/L	<0.14	20	20	18.7	19.2	94	96	64-146	3	30		
sec-Butylbenzene	ug/L	<0.12	20	20	20.5	21.2	103	106	67-144	3	30		
Styrene	ug/L	<0.14	20	20	18.1	18.4	90	92	67-136	2	30		
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.0	17.9	90	89	60-134	1	30		
tert-Butyl Alcohol	ug/L	<2.2	200	200	226	229	113	115	56-146	1	30		
tert-Butylbenzene	ug/L	<0.15	20	20	20.1	20.7	101	103	68-135	3	30		
Tetrachloroethene	ug/L	<0.16	20	20	19.4	20.0	97	100	67-148	3	30		
Tetrahydrofuran	ug/L	<4.3	200	200	230	240	115	120	51-141	4	30		
Toluene	ug/L	<0.17	20	20	19.4	19.8	97	99	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.8	19.7	99	98	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	17.3	17.7	87	89	67-134	2	30		
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	40.0	41.9	80	84	30-150	5	30		
Trichloroethene	ug/L	<0.18	20	20	22.0	21.8	110	109	64-149	1	30		
Trichlorofluoromethane	ug/L	<0.13	20	20	22.0	23.4	110	117	75-150	6	30		
Vinyl acetate	ug/L	<1.5	20	20	20.9	20.6	105	103	49-143	2	30		
Vinyl chloride	ug/L	<0.096	20	20	20.6	22.1	103	111	75-133	7	30		
Xylene (Total)	ug/L	<0.24	60	60	61.5	62.7	103	105	63-142	2	30		
1,2-Dichloroethane-d4 (S)	%						94	90	75-137				
4-Bromofluorobenzene (S)	%						97	98	75-125				
Toluene-d8 (S)	%						95	95	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### WORKORDER QUALIFIERS

WO: 10403561

[1] The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403561

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10403561001	STARK-GW-091217	EPA 8260B	498194		

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### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403561

**Section A**  
Required Client Information:

Company: UPRR  
Address: 1400 W. 52nd Ave.  
Denver, CO 80221  
Email: atheria@up.com  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Requested Due Date: 24 Hr / 3 Day (10 Day)

**Section B**  
Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
Copy To: Steve Demus, Lindsey Baumann  
Copy To: David Hodson, UPRR-Sysdat@ghd.com  
Purchase Order # \_\_\_\_\_  
Project Name: Freeman, WA - Cenex Harvest Lease  
Project #: \_\_\_\_\_

**Section C**  
Invoice Information:

Attention: Anne Theriault (atheria@up.com)  
Company: UPRR  
Address: 1400 W. 52nd Ave, Denver, CO 80221  
Pace Quote: Contract# 758938  
Pace Project Manager: Jennifer Gross  
Pace Profile #: 36447 / 4

Page: 1 of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					Analyses Test	Requested Analysis Filtered (Y/N)				Regulatory Agency	State / Location												
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate		Other	Y/N	Y	Low Level VOCs by 8260			6020 Total Iron	6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus	WA / Freeman								
						DATE	TIME	DATE	TIME																										
1	STARK-GW-091217	WT	G					9-12-17	1454		3																								
2	TB-091217	WT	G					9-12-17	0700		2																								001 Trip Blank
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
*Field filtered by client	JLB/CH2M	9-15-17	1142	[Signature]	9/16/17	855	2.4	3.4	9
							2.9	0.7	9
							6.4		9

<b>SAMPLER NAME AND SIGNATURE</b>	
PRINT Name of SAMPLER: LK Baumann	DATE Signed: 9-15-17
SIGNATURE of SAMPLER: [Signature]	

TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)



Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.23**

Document Revised: 30Aug2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: \_\_\_\_\_ Project #: \_\_\_\_\_

**WO# : 10403561**  
  
 10403561  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 702145755392, 702145755381, 702145755486,  
702145753780, 702145755473  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS  
 Thermometer Used:  151401163  G87A9155100842  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 22.20, 4.11, 5.9 Cooler Temp Corrected (°C): 2.4, 3.4, 3.9, 0.7, 5.4  
 Temp should be above freezing to 6°C Correction Factor: 0.2, -0.5 Date and Initials of Person Examining Contents: 05/16/17

Biological Tissue Frozen?  Yes  No  N/A  
 USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>Lot</u>	12.
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>trip blanks 9/19/17</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased): <u>MIA</u>	15. <u>Standard trip blanks 10403559</u>

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: CH2M Hill Staff Date/Time: 9/18/17  
 Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1355</u> Temp: <u>22.2, 5.9</u>	Corrected Temp: <u>3.9, 0.7</u>
Time: <u>1410</u> put in cooler	Corrected Temp: <u>5.4</u>
Time: _____ Temp: _____	Corrected Temp: _____

**Notified of headspace.**

Project Manager Review: Quanda J. Albrecht Date: 9/18/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 27, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

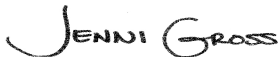
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403562

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403562

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403562001	REED-GW-091317	Water	09/13/17 10:30	09/16/17 08:55

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403562001	REED-GW-091317	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403562001</b>	<b>REED-GW-091317</b>					
EPA 8260B	Acetone	36.2	ug/L	20.0	09/26/17 01:54	

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

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**Date:** September 27, 2017

The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 27, 2017

**General Information:**

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498677

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10403562

Sample: REED-GW-091317 Lab ID: 10403562001 Collected: 09/13/17 10:30 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 01:54	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 01:54	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 01:54	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 01:54	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 01:54	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 01:54	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 01:54	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 01:54	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 01:54	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 01:54	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 01:54	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 01:54	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 01:54	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 01:54	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 01:54	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 01:54	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 01:54	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 01:54	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 01:54	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 01:54	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 01:54	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 01:54	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 01:54	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 01:54	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 01:54	108-10-1	
Acetone	36.2	ug/L	20.0	8.8	1		09/26/17 01:54	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 01:54	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 01:54	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 01:54	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 01:54	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 01:54	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 01:54	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 01:54	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/26/17 01:54	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/26/17 01:54	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 01:54	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/26/17 01:54	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 01:54	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10403562

Sample: REED-GW-091317 Lab ID: 10403562001 Collected: 09/13/17 10:30 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 01:54	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 01:54	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 01:54	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 01:54	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 01:54	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 01:54	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 01:54	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 01:54	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 01:54	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/26/17 01:54	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 01:54	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 01:54	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 01:54	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 01:54	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 01:54	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 01:54	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 01:54	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 01:54	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 01:54	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 01:54	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 01:54	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 01:54	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/26/17 01:54	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 01:54	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 01:54	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 01:54	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 01:54	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		09/26/17 01:54	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1		09/26/17 01:54	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		09/26/17 01:54	460-00-4	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

QC Batch: 498677

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10403562001

METHOD BLANK: 2711212

Matrix: Water

Associated Lab Samples: 10403562001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/25/17 18:29	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/25/17 18:29	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/25/17 18:29	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/25/17 18:29	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/25/17 18:29	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/25/17 18:29	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/25/17 18:29	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/25/17 18:29	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/25/17 18:29	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/25/17 18:29	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/25/17 18:29	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/25/17 18:29	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/25/17 18:29	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/25/17 18:29	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/25/17 18:29	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/25/17 18:29	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/25/17 18:29	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/25/17 18:29	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/25/17 18:29	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/25/17 18:29	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/25/17 18:29	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/25/17 18:29	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/25/17 18:29	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/25/17 18:29	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/25/17 18:29	
Acetone	ug/L	<8.8	20.0	8.8	09/25/17 18:29	
Acrolein	ug/L	<4.8	10.0	4.8	09/25/17 18:29	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/25/17 18:29	
Benzene	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/25/17 18:29	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/25/17 18:29	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/25/17 18:29	
Bromoform	ug/L	<1.0	4.0	1.0	09/25/17 18:29	
Bromomethane	ug/L	<1.5	4.0	1.5	09/25/17 18:29	
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/25/17 18:29	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/25/17 18:29	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

METHOD BLANK: 2711212

Matrix: Water

Associated Lab Samples: 10403562001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
Chloroethane	ug/L	<0.44	1.0	0.44	09/25/17 18:29	
Chloroform	ug/L	<0.46	1.0	0.46	09/25/17 18:29	
Chloromethane	ug/L	<1.1	4.0	1.1	09/25/17 18:29	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/25/17 18:29	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/25/17 18:29	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
Dibromomethane	ug/L	<0.50	1.0	0.50	09/25/17 18:29	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/25/17 18:29	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/25/17 18:29	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/25/17 18:29	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/25/17 18:29	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/25/17 18:29	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/25/17 18:29	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/25/17 18:29	
Naphthalene	ug/L	<0.42	1.0	0.42	09/25/17 18:29	
o-Xylene	ug/L	<0.11	0.50	0.11	09/25/17 18:29	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/25/17 18:29	
Styrene	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/25/17 18:29	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/25/17 18:29	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/25/17 18:29	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/25/17 18:29	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/25/17 18:29	
Toluene	ug/L	<0.17	0.50	0.17	09/25/17 18:29	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/25/17 18:29	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	09/25/17 18:29	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/25/17 18:29	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/25/17 18:29	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/25/17 18:29	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/25/17 18:29	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/25/17 18:29	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/25/17 18:29	
1,2-Dichloroethane-d4 (S)	%	104	75-137		09/25/17 18:29	
4-Bromofluorobenzene (S)	%	100	75-125		09/25/17 18:29	
Toluene-d8 (S)	%	103	75-125		09/25/17 18:29	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

LABORATORY CONTROL SAMPLE & LCSD: 2711213

2711214

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.6	21.2	103	106	75-136	3	30	
1,1,1-Trichloroethane	ug/L	20	20.7	20.3	104	102	75-129	2	30	
1,1,2,2-Tetrachloroethane	ug/L	20	20.9	21.0	104	105	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	21.5	21.8	107	109	75-125	2	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.5	20.4	103	102	69-126	0	30	
1,1-Dichloroethane	ug/L	20	20.4	20.5	102	103	75-125	1	30	
1,1-Dichloroethene	ug/L	20	20.4	20.5	102	102	75-125	0	30	
1,1-Dichloropropene	ug/L	20	20.2	20.6	101	103	75-125	2	30	
1,2,3-Trichlorobenzene	ug/L	20	22.0	22.9	110	114	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	20.6	20.4	103	102	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	20.4	20.6	102	103	75-125	1	30	
1,2,4-Trimethylbenzene	ug/L	20	21.2	22.1	106	111	75-125	4	30	
1,2-Dibromo-3-chloropropane	ug/L	50	50.7	53.2	101	106	71-130	5	30	
1,2-Dibromoethane (EDB)	ug/L	20	21.1	21.7	106	108	75-125	3	30	
1,2-Dichlorobenzene	ug/L	20	21.1	21.0	106	105	75-125	0	30	
1,2-Dichloroethane	ug/L	20	19.2	19.2	96	96	70-125	0	30	
1,2-Dichloroethene (Total)	ug/L	40	40.9	40.2	102	101	75-125	2	30	
1,2-Dichloropropane	ug/L	20	19.4	19.9	97	99	75-125	3	30	
1,3,5-Trimethylbenzene	ug/L	20	21.9	22.4	110	112	75-125	2	30	
1,3-Dichlorobenzene	ug/L	20	21.2	20.9	106	104	75-125	2	30	
1,3-Dichloropropane	ug/L	20	20.8	21.1	104	105	75-125	1	30	
1,4-Dichlorobenzene	ug/L	20	20.9	20.8	104	104	75-125	0	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	402	432	101	108	64-140	7	30	
2,2,4-Trimethylpentane	ug/L	20	19.4	20.1	97	101	68-125	3	30	
2,2-Dichloropropane	ug/L	20	19.5	19.3	97	96	70-131	1	30	
2-Butanone (MEK)	ug/L	100	97.5	97.4	98	97	69-125	0	30	
2-Chlorotoluene	ug/L	20	21.8	20.5	109	102	75-125	6	30	
2-Hexanone	ug/L	100	110	115	110	115	73-129	5	30	
4-Chlorotoluene	ug/L	20	21.5	21.2	108	106	75-125	2	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	106	111	106	111	73-125	4	30	
Acetone	ug/L	100	112	109	112	109	66-126	3	30	
Acrolein	ug/L	200	200	197	100	98	56-150	2	30	
Acrylonitrile	ug/L	200	207	202	103	101	68-129	3	30	
Benzene	ug/L	20	19.9	19.2	99	96	75-125	4	30	
Bromobenzene	ug/L	20	21.5	21.3	108	106	75-125	1	30	
Bromochloromethane	ug/L	20	20.6	19.4	103	97	75-126	6	30	
Bromodichloromethane	ug/L	20	20.4	19.7	102	99	75-133	3	30	
Bromoform	ug/L	20	19.0	19.0	95	95	62-142	0	30	
Bromomethane	ug/L	20	22.5	20.6	113	103	34-143	9	30	
Carbon disulfide	ug/L	20	19.3	17.1	96	86	71-125	12	30	
Carbon tetrachloride	ug/L	20	20.7	20.2	104	101	71-145	3	30	
Chlorobenzene	ug/L	20	20.6	20.7	103	103	75-125	0	30	
Chloroethane	ug/L	20	20.6	21.1	103	106	75-125	2	30	
Chloroform	ug/L	20	19.1	18.3	95	91	75-125	4	30	
Chloromethane	ug/L	20	19.6	17.9	98	89	54-125	9	30	
cis-1,2-Dichloroethene	ug/L	20	20.9	20.4	104	102	75-125	2	30	
cis-1,3-Dichloropropene	ug/L	20	19.6	19.6	98	98	75-125	0	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

LABORATORY CONTROL SAMPLE & LCSD: 2711213			2711214								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	21.0	21.2	105	106	74-141	1	30		
Dibromomethane	ug/L	20	20.3	20.2	101	101	75-125	0	30		
Dichlorodifluoromethane	ug/L	20	19.8	19.9	99	99	59-130	0	30		
Dichlorofluoromethane	ug/L	20	20.1	20.1	100	101	75-125	0	30		
Diisopropyl ether	ug/L	20	19.8	19.9	99	100	69-125	0	30		
Ethyl-tert-butyl ether	ug/L	20	21.0	21.1	105	105	73-125	0	30		
Ethylbenzene	ug/L	20	20.8	21.5	104	107	75-125	3	30		
Hexachloro-1,3-butadiene	ug/L	20	21.3	21.9	107	109	75-131	3	30		
Isopropylbenzene (Cumene)	ug/L	20	21.1	21.6	105	108	75-125	2	30		
m&p-Xylene	ug/L	40	43.3	43.4	108	109	75-125	0	30		
Methyl-tert-butyl ether	ug/L	20	20.7	20.5	103	103	75-125	1	30		
Methylene Chloride	ug/L	20	20.0	18.9	100	94	73-125	6	30		
n-Butylbenzene	ug/L	20	20.9	22.0	104	110	75-125	5	30		
n-Propylbenzene	ug/L	20	21.2	22.1	106	110	75-125	4	30		
Naphthalene	ug/L	20	20.1	21.8	100	109	74-125	8	30		
o-Xylene	ug/L	20	21.4	22.1	107	111	75-125	3	30		
p-Isopropyltoluene	ug/L	20	20.2	20.6	101	103	75-125	2	30		
sec-Butylbenzene	ug/L	20	21.3	22.3	106	112	75-125	5	30		
Styrene	ug/L	20	19.5	20.0	97	100	75-125	3	30		
tert-Amylmethyl ether	ug/L	20	20.9	20.4	105	102	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	209	201	104	100	69-131	4	30		
tert-Butylbenzene	ug/L	20	21.1	22.3	106	111	75-125	5	30		
Tetrachloroethene	ug/L	20	20.7	20.7	104	103	75-125	0	30		
Tetrahydrofuran	ug/L	200	225	216	113	108	65-127	4	30		
Toluene	ug/L	20	20.2	19.9	101	100	75-125	1	30		
trans-1,2-Dichloroethene	ug/L	20	20.1	19.8	100	99	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	20	19.6	20.3	98	102	75-125	4	30		
trans-1,4-Dichloro-2-butene	ug/L	50	48.7	49.6	97	99	30-150	2	30		
Trichloroethene	ug/L	20	20.3	20.8	102	104	75-125	2	30		
Trichlorofluoromethane	ug/L	20	21.0	21.5	105	108	71-140	2	30		
Vinyl acetate	ug/L	20	20.3	19.6	102	98	68-137	4	30		
Vinyl chloride	ug/L	20	20.6	21.4	103	107	70-125	4	30		
Xylene (Total)	ug/L	60	64.8	65.5	108	109	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				101	100	75-137				
4-Bromofluorobenzene (S)	%				102	101	75-125				
Toluene-d8 (S)	%				104	105	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### WORKORDER QUALIFIERS

WO: 10403562

[1] The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

### BATCH QUALIFIERS

Batch: 498677

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10403562

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10403562

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10403562001	REED-GW-091317	EPA 8260B	498677		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403562

Section A

Section B

Section C

Required Client Information:

Required Project Information:

Invoice Information:

Company:	CH2M Hill
Address:	999 W. Riverside Ave, Suite 500 Spokane, WA 99201
Email:	
Phone:	
Fax:	
Requested Due Date:	10 Day Standard

Report To:	Mark Ochsner, Brad Ostapkowicz
Copy To:	Steve Demus, Lindsey Baumann
Copy To:	David Hodson, UPRR-Sysdat@ghd.com
Purchase Order #:	PEDD# 1497
Project Name:	Freeman WA-Grain Handling Facility
Project #:	1497

Attention:	Anne Walsh
Company:	UPRR
Address:	1400 W. 52nd Ave, Denver, CO 80221
Pace Quote:	Contract# 758938
Pace Project Manager:	Jennifer Gross
Pace Profile #:	36447 / 4

Regulatory Agency	
State / Location	WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test Y/N	Requested Analysis: Filtered (Y/N)										MS/MSD Requested						
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2							
1	REED-GW-091317			WT G		9/13/17	1030		3			X			X																		001 Trip Blank		
2	TB-091317			WT G		9/13/17	0700		2			X			X																				
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	JKH/CH2M	9-15-17	1157	[Signature]	9/16/17	855	2.4 3.4 3.7 0.7 5.4
*Field filtered by client							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: L. K. Baumann

SIGNATURE of SAMPLER: [Signature]

DATE Signed: 9-15-17

TEMP in C

Received on Ice (Y/N)

Custody Sealed (Y/N)

Cooler (Y/N)

Samples Intact (Y/N)



Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.23**

Document Revised: 30Aug2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: \_\_\_\_\_ Project #: \_\_\_\_\_

**WO# 10403562**

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 70145755372, 70145755381, 70145755418, 701457553780, 701457553781

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: P5 Temp Blank?  Yes  No

Thermometer  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 2.2, 2.0, 4.1, 1.2, 5.9 Cooler Temp Corrected (°C): 2.4, 3.4, 3.9, 0.7, 5.4 Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C Correction Factor: 0.2, 0.8 Date and Initials of Person Examining Contents: 9/16/17

USDA Regulated Soil  N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-includes Date/Time/ID/Analysis Matrix: <u>WJ</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide)	
Exceptions: <u>VOA</u> , Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	
Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>trip blank 9/19 1596</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>Share Trip Blank w/ 10403559</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>N/A</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: CH2M Hill Staff Date/Time: 9/18/17 Field Data Required?  Yes  No

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1355</u> Temp: <u>2.5, 3.4</u> Corrected: <u>2.4, 3.4</u>	
Time: <u>1410</u> put in cooler	Corrected Temp: <u>5.4</u>
Time: _____ Temp: _____	Corrected Temp: _____

Notified of headspace.

Project Manager Review: Awanda J. Albrecht Date: 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



September 22, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

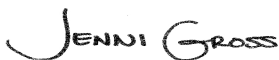
RE: Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403563

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403563001	LANG-GW-091217	Water	09/12/17 11:00	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403563001	LANG-GW-091217	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403563001</b>	<b>LANG-GW-091217</b>					
EPA 8260B	Acetone	33.1	ug/L	20.0	09/22/17 04:55	

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

---

**Date:** September 22, 2017

The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 498194

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2708552)
  - Bromomethane
- LANG-GW-091217 (Lab ID: 10403563001)
  - Bromomethane
- LCS (Lab ID: 2708553)
  - Bromomethane
- MS (Lab ID: 2708554)
  - Bromomethane
- MSD (Lab ID: 2708555)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

QC Batch: 498194

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404181007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708554)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Acetone
  - Carbon tetrachloride

### Additional Comments:

Analyte Comments:

QC Batch: 498194

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2708554)
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Carbon tetrachloride

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

Sample: LANG-GW-091217 Lab ID: 10403563001 Collected: 09/12/17 11:00 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 04:55	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 04:55	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 04:55	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 04:55	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 04:55	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:55	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:55	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 04:55	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:55	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 04:55	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 04:55	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 04:55	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 04:55	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 04:55	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 04:55	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 04:55	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 04:55	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:55	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 04:55	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 04:55	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 04:55	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 04:55	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 04:55	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 04:55	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 04:55	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 04:55	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:55	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 04:55	108-10-1	
Acetone	33.1	ug/L	20.0	8.8	1		09/22/17 04:55	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 04:55	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 04:55	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:55	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:55	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 04:55	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 04:55	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 04:55	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 04:55	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 04:55	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/22/17 04:55	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 04:55	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 04:55	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 04:55	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 04:55	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

Sample: LANG-GW-091217 Lab ID: 10403563001 Collected: 09/12/17 11:00 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 04:55	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 04:55	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 04:55	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 04:55	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 04:55	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 04:55	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 04:55	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 04:55	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 04:55	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 04:55	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 04:55	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 04:55	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 04:55	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 04:55	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 04:55	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 04:55	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 04:55	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:55	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 04:55	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 04:55	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:55	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 04:55	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 04:55	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 04:55	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 04:55	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 04:55	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 04:55	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 04:55	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 04:55	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 04:55	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 04:55	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1		09/22/17 04:55	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		09/22/17 04:55	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403563

QC Batch: 498194 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10403563001

METHOD BLANK: 2708552 Matrix: Water  
Associated Lab Samples: 10403563001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/21/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/21/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/21/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/21/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/21/17 23:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/21/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/21/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/21/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/21/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/21/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/21/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/21/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/21/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/21/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	09/21/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	09/21/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/21/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	09/21/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/21/17 23:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403563001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	09/21/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	09/21/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	09/21/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/21/17 23:24	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/21/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/21/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/21/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/21/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/21/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/21/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	09/21/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	09/21/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Styrene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/21/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/21/17 23:24	
Toluene	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/21/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/21/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/21/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/21/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/21/17 23:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		09/21/17 23:24	
4-Bromofluorobenzene (S)	%	100	75-125		09/21/17 23:24	
Toluene-d8 (S)	%	95	75-125		09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-136	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	23.3	116	71-138	
1,1,2-Trichloroethane	ug/L	20	21.4	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.1	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,3-Trichloropropane	ug/L	20	22.3	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.2	106	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	93	75-125	
1,2-Dichloropropane	ug/L	20	20.0	100	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	390	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	13.7	69	68-125	
2,2-Dichloropropane	ug/L	20	16.5	82	70-131	
2-Butanone (MEK)	ug/L	100	113	113	69-125	
2-Chlorotoluene	ug/L	20	19.9	99	75-125	
2-Hexanone	ug/L	100	121	121	73-129	
4-Chlorotoluene	ug/L	20	19.7	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	116	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	231	115	68-129	
Benzene	ug/L	20	18.5	92	75-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	19.9	100	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	7.2	36	34-143	CL
Carbon disulfide	ug/L	20	16.6	83	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	20.9	104	75-125	
Chloroethane	ug/L	20	20.9	104	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	17.5	88	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403563

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.7	94	74-141	
Dibromomethane	ug/L	20	22.1	110	75-125	
Dichlorodifluoromethane	ug/L	20	19.0	95	59-130	
Dichlorofluoromethane	ug/L	20	17.9	89	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.6	93	73-125	
Ethylbenzene	ug/L	20	19.7	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.4	97	75-125	
m&p-Xylene	ug/L	40	40.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	18.5	93	75-125	
Methylene Chloride	ug/L	20	17.3	86	73-125	
n-Butylbenzene	ug/L	20	19.1	96	75-125	
n-Propylbenzene	ug/L	20	19.9	100	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	19.9	100	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	19.2	96	75-125	
Styrene	ug/L	20	18.2	91	75-125	
tert-Amylmethyl ether	ug/L	20	18.6	93	71-126	
tert-Butyl Alcohol	ug/L	200	243	121	69-131	
tert-Butylbenzene	ug/L	20	19.0	95	75-125	
Tetrachloroethene	ug/L	20	19.0	95	75-125	
Tetrahydrofuran	ug/L	200	204	102	65-127	
Toluene	ug/L	20	19.6	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.6	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.6	88	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.0	80	30-150	
Trichloroethene	ug/L	20	20.3	101	75-125	
Trichlorofluoromethane	ug/L	20	20.6	103	71-140	
Vinyl acetate	ug/L	20	22.8	114	68-137	
Vinyl chloride	ug/L	20	19.6	98	70-125	
Xylene (Total)	ug/L	60	59.9	100	75-125	
1,2-Dichloroethane-d4 (S)	%			89	75-137	
4-Bromofluorobenzene (S)	%			96	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554 2708555

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10404181007 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	19.9	20.4	99	102	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	20	21.3	21.0	106	105	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	22.6	23.3	113	116	60-142	3	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20	20.2	20.3	101	102	75-128	1	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	19.9	20.0	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.2	19.3	96	96	70-129	0	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.3	20.2	101	101	67-141	0	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.9	20.0	99	100	64-144	1	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.0	21.8	105	109	66-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.9	21.4	105	107	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	20.0	20.4	100	102	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	55.2	56.3	110	113	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	19.5	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.3	20.9	102	104	68-135	3	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	18.6	18.9	93	94	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	39.2	38.8	98	97	69-134	1	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.6	20.6	103	103	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.5	21.0	103	105	64-146	2	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.8	20.6	99	103	69-135	4	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.3	19.5	96	97	67-128	1	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	20.6	99	103	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	399	392	100	98	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.1	16.9	81	85	48-150	5	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	17.5	17.1	88	85	50-150	2	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	115	116	115	116	58-125	1	30		
2-Chlorotoluene	ug/L	<0.20	20	20	20.0	20.5	100	103	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	119	120	119	120	61-134	1	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.2	20.0	96	100	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	115	117	115	117	61-130	2	30		
Acetone	ug/L	13.1J	100	100	160	164	147	151	51-140	2	30	M1	
Acrolein	ug/L	<4.8	200	200	198	205	99	103	48-150	3	30		
Acrylonitrile	ug/L	<4.9	200	200	212	214	106	107	55-134	1	30		
Benzene	ug/L	<0.13	20	20	19.4	19.0	97	95	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	19.4	20.3	97	101	67-138	5	30		
Bromochloromethane	ug/L	<0.38	20	20	19.0	19.1	95	95	66-138	1	30		
Bromodichloromethane	ug/L	<0.20	20	20	20.2	20.5	101	102	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	19.6	20.4	98	102	65-129	4	30		
Bromomethane	ug/L	<1.5	20	20	9.0	11.2	45	56	41-150	22	30	CL	
Carbon disulfide	ug/L	0.49J	20	20	17.9	17.6	87	85	72-132	2	30		
Carbon tetrachloride	ug/L	126	20	20	137	134	51	40	75-150	2	30	E,M1	
Chlorobenzene	ug/L	<0.14	20	20	20.2	20.6	101	103	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	20.8	22.1	104	110	74-138	6	30		
Chloroform	ug/L	9.5	20	20	27.6	27.3	91	89	74-125	1	30		
Chloromethane	ug/L	<1.1	20	20	17.7	18.5	89	93	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.4	19.1	97	96	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	18.8	18.9	94	94	66-129	1	30		
Dibromochloromethane	ug/L	<0.13	20	20	18.0	18.5	90	93	75-133	3	30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.									
Dibromomethane	ug/L	<0.50	20	20	21.5	21.4	108	107	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.31	20	20	20.1	22.2	101	111	72-150	10	30		
Dichlorofluoromethane	ug/L	<0.38	20	20	17.9	18.7	89	94	75-129	5	30		
Diisopropyl ether	ug/L	<0.12	20	20	20.9	20.5	105	103	62-128	2	30		
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	18.8	18.6	94	93	63-132	1	30		
Ethylbenzene	ug/L	<0.14	20	20	20.2	20.5	101	102	72-130	1	30		
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	19.7	20.2	99	101	71-150	2	30		
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.0	20.5	100	103	70-136	3	30		
m&p-Xylene	ug/L	<0.24	40	40	40.9	41.5	102	104	64-142	2	30		
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.2	18.1	91	90	72-125	1	30		
Methylene Chloride	ug/L	<1.2	20	20	17.1	16.7	85	84	60-132	2	30		
n-Butylbenzene	ug/L	<0.13	20	20	20.4	21.0	102	105	60-150	3	30		
n-Propylbenzene	ug/L	<0.12	20	20	21.2	22.0	106	110	63-142	4	30		
Naphthalene	ug/L	<0.42	20	20	20.6	21.5	103	107	67-125	4	30		
o-Xylene	ug/L	<0.11	20	20	20.7	21.2	103	106	60-143	2	30		
p-Isopropyltoluene	ug/L	<0.14	20	20	18.7	19.2	94	96	64-146	3	30		
sec-Butylbenzene	ug/L	<0.12	20	20	20.5	21.2	103	106	67-144	3	30		
Styrene	ug/L	<0.14	20	20	18.1	18.4	90	92	67-136	2	30		
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.0	17.9	90	89	60-134	1	30		
tert-Butyl Alcohol	ug/L	<2.2	200	200	226	229	113	115	56-146	1	30		
tert-Butylbenzene	ug/L	<0.15	20	20	20.1	20.7	101	103	68-135	3	30		
Tetrachloroethene	ug/L	<0.16	20	20	19.4	20.0	97	100	67-148	3	30		
Tetrahydrofuran	ug/L	<4.3	200	200	230	240	115	120	51-141	4	30		
Toluene	ug/L	<0.17	20	20	19.4	19.8	97	99	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.8	19.7	99	98	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	17.3	17.7	87	89	67-134	2	30		
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	40.0	41.9	80	84	30-150	5	30		
Trichloroethene	ug/L	<0.18	20	20	22.0	21.8	110	109	64-149	1	30		
Trichlorofluoromethane	ug/L	<0.13	20	20	22.0	23.4	110	117	75-150	6	30		
Vinyl acetate	ug/L	<1.5	20	20	20.9	20.6	105	103	49-143	2	30		
Vinyl chloride	ug/L	<0.096	20	20	20.6	22.1	103	111	75-133	7	30		
Xylene (Total)	ug/L	<0.24	60	60	61.5	62.7	103	105	63-142	2	30		
1,2-Dichloroethane-d4 (S)	%						94	90	75-137				
4-Bromofluorobenzene (S)	%						97	98	75-125				
Toluene-d8 (S)	%						95	95	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403563

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### WORKORDER QUALIFIERS

WO: 10403563

[1] The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.  
E Analyte concentration exceeded the calibration range. The reported result is estimated.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest

Pace Project No.: 10403563

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest  
Pace Project No.: 10403563

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10403563001	LANG-GW-091217	EPA 8260B	498194		

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### REPORT OF LABORATORY ANALYSIS

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**CHAIN-OF-CUSTODY / Analytical Request Document**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403563  
Page: 1 Of 1

<b>Section A</b> Required Client Information: Company: UPRR Address: 1400 W. 52nd Ave. Denver, CO 80221 Email: atheria@up.com Phone: _____ Fax: _____ Requested Due Date: 24 Hr / 3 Day <u>(10 Day)</u>		<b>Section B</b> Required Project Information: Report To: Mark Ochsner, Brad Ostapowicz Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com Purchase Order # _____ Project Name: Freeman, WA - Cenex Harvest Lease Project #: _____		<b>Section C</b> Invoice Information: Attention: Anne Theriault (atheria@up.com) Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221 Pace Quote: Contract# 758938 Pace Project Manager: Jennifer Gross Pace Profile #: 36447 / 4	
		<b>Regulatory Agency</b>			
		<b>State / Location</b>		WA / Freeman	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P CL SL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Requested Analysis Filtered (Y/N)								
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Analyses Test	Low Level VOCs by 8260	6020 Total Iron	6020 Dissolved Iron (Field Filtered)		SM4500P-E Total Phosphorus			
						DATE	TIME	DATE	TIME																		
1	LANG-GW-091217			WTG			9/12/17	1100	3																	001 Trip Blank	
2	TB-091217			WTG			9/12/17	0700	2																		
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
*Field filtered by client	<i>[Signature]</i> / CH2M	9-15-17	1133	<i>[Signature]</i>	9/16/17	855	2.4		7	7	7
							3.7				
							0.7				
							5.4				

SAMPLER NAME AND SIGNATURE			TEMP In C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <i>L. K. Baumann</i>							
SIGNATURE OF SAMPLER: <i>[Signature]</i>	DATE Signed: 9-15-17						



Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.23**

Document Revised: 30Aug2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

Sample Condition  
 Upon Receipt - ESI  
 Tech Specs

Client Name: AAI  
CH2M Hill UPRR 9/18/17

Project #:

**WO# : 10403563**

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 702145755372, 702145755381, 702145755418,  
702145753780, 702145755347

Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS  
 Thermometer  151401163  G87A9155100842  
 Used: \_\_\_\_\_ Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 2.2, 3.0, 4.1, 1.0 Cooler Temp Corrected (°C): 2.4, 3.9, 3.9, 0.7, 5.4  
 Temp should be above freezing to 6°C Correction Factor: 0.2, 0.5

Biological Tissue Frozen?  Yes  No  N/A  
 Date and Initials of Person Examining Contents: 9/16/17

USDA Regulated Soil  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>trip blank 9/18/17</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Should trip blank be 10403559</u>
Pace Trip Blank Lot # (if purchased): <u>N/A</u>	

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: CH2M Hill Staff

Field Data Required?  Yes  No

Date/Time: 9/18/17

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1353</u> Temp: <u>2.4, 3.9</u>	Corrected Temp: <u>3.9, 0.7</u>
Time: <u>1410</u> put in cooler	Corrected Temp: <u>5.4</u>
Time: _____ Temp: _____	Corrected Temp: _____

notified of head space

Project Manager Review: Amanda J. Albrecht

Date: 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 22, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

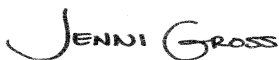
RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10403564

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403564001	THORSON-GW-091217	Water	09/12/17 14:20	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

---

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403564001	THORSON-GW-091217	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403564001</b>	<b>THORSON-GW-091217</b>					
EPA 8260B	Acetone	21.6	ug/L	20.0	09/22/17 05:17	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

---

**Date:** September 22, 2017

The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 498194

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2708552)
  - Bromomethane
- LCS (Lab ID: 2708553)
  - Bromomethane
- MS (Lab ID: 2708554)
  - Bromomethane
- MSD (Lab ID: 2708555)
  - Bromomethane
- THORSON-GW-091217 (Lab ID: 10403564001)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

QC Batch: 498194

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404181007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708554)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Acetone
  - Carbon tetrachloride

### Additional Comments:

Analyte Comments:

QC Batch: 498194

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2708554)
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Carbon tetrachloride

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

Sample: **THORSON-GW-091217** Lab ID: **10403564001** Collected: 09/12/17 14:20 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 05:17	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 05:17	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 05:17	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 05:17	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 05:17	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:17	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:17	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 05:17	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:17	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 05:17	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 05:17	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 05:17	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 05:17	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 05:17	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 05:17	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 05:17	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:17	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 05:17	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 05:17	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 05:17	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 05:17	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 05:17	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 05:17	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 05:17	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 05:17	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 05:17	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 05:17	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 05:17	108-10-1	
Acetone	21.6	ug/L	20.0	8.8	1		09/22/17 05:17	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 05:17	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 05:17	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 05:17	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 05:17	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 05:17	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 05:17	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 05:17	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 05:17	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 05:17	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/22/17 05:17	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 05:17	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 05:17	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 05:17	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 05:17	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

Sample: THORSON-GW-091217 Lab ID: 10403564001 Collected: 09/12/17 14:20 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 05:17	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 05:17	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 05:17	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 05:17	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 05:17	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 05:17	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 05:17	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 05:17	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 05:17	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 05:17	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 05:17	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 05:17	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 05:17	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 05:17	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 05:17	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 05:17	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 05:17	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 05:17	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 05:17	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 05:17	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 05:17	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 05:17	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:17	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 05:17	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 05:17	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 05:17	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 05:17	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 05:17	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 05:17	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 05:17	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 05:17	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		09/22/17 05:17	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		09/22/17 05:17	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10403564

QC Batch: 498194 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10403564001

METHOD BLANK: 2708552 Matrix: Water  
Associated Lab Samples: 10403564001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/21/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/21/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/21/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/21/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/21/17 23:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/21/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/21/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/21/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/21/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/21/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/21/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/21/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/21/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/21/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	09/21/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	09/21/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/21/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	09/21/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/21/17 23:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/21/17 23:24	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403564001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	09/21/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	09/21/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	09/21/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/21/17 23:24	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/21/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/21/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/21/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/21/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/21/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/21/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	09/21/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	09/21/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Styrene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/21/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/21/17 23:24	
Toluene	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/21/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/21/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/21/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/21/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/21/17 23:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		09/21/17 23:24	
4-Bromofluorobenzene (S)	%	100	75-125		09/21/17 23:24	
Toluene-d8 (S)	%	95	75-125		09/21/17 23:24	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-136	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	23.3	116	71-138	
1,1,2-Trichloroethane	ug/L	20	21.4	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.1	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,3-Trichloropropane	ug/L	20	22.3	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.2	106	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	93	75-125	
1,2-Dichloropropane	ug/L	20	20.0	100	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	390	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	13.7	69	68-125	
2,2-Dichloropropane	ug/L	20	16.5	82	70-131	
2-Butanone (MEK)	ug/L	100	113	113	69-125	
2-Chlorotoluene	ug/L	20	19.9	99	75-125	
2-Hexanone	ug/L	100	121	121	73-129	
4-Chlorotoluene	ug/L	20	19.7	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	116	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	231	115	68-129	
Benzene	ug/L	20	18.5	92	75-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	19.9	100	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	7.2	36	34-143	CL
Carbon disulfide	ug/L	20	16.6	83	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	20.9	104	75-125	
Chloroethane	ug/L	20	20.9	104	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	17.5	88	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.7	94	74-141	
Dibromomethane	ug/L	20	22.1	110	75-125	
Dichlorodifluoromethane	ug/L	20	19.0	95	59-130	
Dichlorofluoromethane	ug/L	20	17.9	89	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.6	93	73-125	
Ethylbenzene	ug/L	20	19.7	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.4	97	75-125	
m&p-Xylene	ug/L	40	40.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	18.5	93	75-125	
Methylene Chloride	ug/L	20	17.3	86	73-125	
n-Butylbenzene	ug/L	20	19.1	96	75-125	
n-Propylbenzene	ug/L	20	19.9	100	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	19.9	100	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	19.2	96	75-125	
Styrene	ug/L	20	18.2	91	75-125	
tert-Amylmethyl ether	ug/L	20	18.6	93	71-126	
tert-Butyl Alcohol	ug/L	200	243	121	69-131	
tert-Butylbenzene	ug/L	20	19.0	95	75-125	
Tetrachloroethene	ug/L	20	19.0	95	75-125	
Tetrahydrofuran	ug/L	200	204	102	65-127	
Toluene	ug/L	20	19.6	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.6	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.6	88	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.0	80	30-150	
Trichloroethene	ug/L	20	20.3	101	75-125	
Trichlorofluoromethane	ug/L	20	20.6	103	71-140	
Vinyl acetate	ug/L	20	22.8	114	68-137	
Vinyl chloride	ug/L	20	19.6	98	70-125	
Xylene (Total)	ug/L	60	59.9	100	75-125	
1,2-Dichloroethane-d4 (S)	%			89	75-137	
4-Bromofluorobenzene (S)	%			96	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554 2708555

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10404181007 Result	Spike Conc.	Spike Conc.	Result								
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	19.9	20.4	99	102	75-137	3	30		
1,1,1-Trichloroethane	ug/L	<0.15	20	20	21.3	21.0	106	105	75-139	1	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	22.6	23.3	113	116	60-142	3	30		
1,1,2-Trichloroethane	ug/L	<0.22	20	20	20.2	20.3	101	102	75-128	1	30		

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	19.9	20.0	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.2	19.3	96	96	70-129	0	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.3	20.2	101	101	67-141	0	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.9	20.0	99	100	64-144	1	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.0	21.8	105	109	66-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.9	21.4	105	107	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	20.0	20.4	100	102	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	55.2	56.3	110	113	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	19.5	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.3	20.9	102	104	68-135	3	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	18.6	18.9	93	94	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	39.2	38.8	98	97	69-134	1	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.6	20.6	103	103	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.5	21.0	103	105	64-146	2	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.8	20.6	99	103	69-135	4	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.3	19.5	96	97	67-128	1	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	20.6	99	103	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	399	392	100	98	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.1	16.9	81	85	48-150	5	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	17.5	17.1	88	85	50-150	2	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	115	116	115	116	58-125	1	30		
2-Chlorotoluene	ug/L	<0.20	20	20	20.0	20.5	100	103	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	119	120	119	120	61-134	1	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.2	20.0	96	100	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	115	117	115	117	61-130	2	30		
Acetone	ug/L	13.1J	100	100	160	164	147	151	51-140	2	30	M1	
Acrolein	ug/L	<4.8	200	200	198	205	99	103	48-150	3	30		
Acrylonitrile	ug/L	<4.9	200	200	212	214	106	107	55-134	1	30		
Benzene	ug/L	<0.13	20	20	19.4	19.0	97	95	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	19.4	20.3	97	101	67-138	5	30		
Bromochloromethane	ug/L	<0.38	20	20	19.0	19.1	95	95	66-138	1	30		
Bromodichloromethane	ug/L	<0.20	20	20	20.2	20.5	101	102	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	19.6	20.4	98	102	65-129	4	30		
Bromomethane	ug/L	<1.5	20	20	9.0	11.2	45	56	41-150	22	30	CL	
Carbon disulfide	ug/L	0.49J	20	20	17.9	17.6	87	85	72-132	2	30		
Carbon tetrachloride	ug/L	126	20	20	137	134	51	40	75-150	2	30	E,M1	
Chlorobenzene	ug/L	<0.14	20	20	20.2	20.6	101	103	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	20.8	22.1	104	110	74-138	6	30		
Chloroform	ug/L	9.5	20	20	27.6	27.3	91	89	74-125	1	30		
Chloromethane	ug/L	<1.1	20	20	17.7	18.5	89	93	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.4	19.1	97	96	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	18.8	18.9	94	94	66-129	1	30		
Dibromochloromethane	ug/L	<0.13	20	20	18.0	18.5	90	93	75-133	3	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Dibromomethane	ug/L	<0.50	20	20	21.5	21.4	108	107	68-134	1	30	
Dichlorodifluoromethane	ug/L	<0.31	20	20	20.1	22.2	101	111	72-150	10	30	
Dichlorofluoromethane	ug/L	<0.38	20	20	17.9	18.7	89	94	75-129	5	30	
Diisopropyl ether	ug/L	<0.12	20	20	20.9	20.5	105	103	62-128	2	30	
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	18.8	18.6	94	93	63-132	1	30	
Ethylbenzene	ug/L	<0.14	20	20	20.2	20.5	101	102	72-130	1	30	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	19.7	20.2	99	101	71-150	2	30	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.0	20.5	100	103	70-136	3	30	
m&p-Xylene	ug/L	<0.24	40	40	40.9	41.5	102	104	64-142	2	30	
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.2	18.1	91	90	72-125	1	30	
Methylene Chloride	ug/L	<1.2	20	20	17.1	16.7	85	84	60-132	2	30	
n-Butylbenzene	ug/L	<0.13	20	20	20.4	21.0	102	105	60-150	3	30	
n-Propylbenzene	ug/L	<0.12	20	20	21.2	22.0	106	110	63-142	4	30	
Naphthalene	ug/L	<0.42	20	20	20.6	21.5	103	107	67-125	4	30	
o-Xylene	ug/L	<0.11	20	20	20.7	21.2	103	106	60-143	2	30	
p-Isopropyltoluene	ug/L	<0.14	20	20	18.7	19.2	94	96	64-146	3	30	
sec-Butylbenzene	ug/L	<0.12	20	20	20.5	21.2	103	106	67-144	3	30	
Styrene	ug/L	<0.14	20	20	18.1	18.4	90	92	67-136	2	30	
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.0	17.9	90	89	60-134	1	30	
tert-Butyl Alcohol	ug/L	<2.2	200	200	226	229	113	115	56-146	1	30	
tert-Butylbenzene	ug/L	<0.15	20	20	20.1	20.7	101	103	68-135	3	30	
Tetrachloroethene	ug/L	<0.16	20	20	19.4	20.0	97	100	67-148	3	30	
Tetrahydrofuran	ug/L	<4.3	200	200	230	240	115	120	51-141	4	30	
Toluene	ug/L	<0.17	20	20	19.4	19.8	97	99	61-140	2	30	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.8	19.7	99	98	62-138	1	30	
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	17.3	17.7	87	89	67-134	2	30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	40.0	41.9	80	84	30-150	5	30	
Trichloroethene	ug/L	<0.18	20	20	22.0	21.8	110	109	64-149	1	30	
Trichlorofluoromethane	ug/L	<0.13	20	20	22.0	23.4	110	117	75-150	6	30	
Vinyl acetate	ug/L	<1.5	20	20	20.9	20.6	105	103	49-143	2	30	
Vinyl chloride	ug/L	<0.096	20	20	20.6	22.1	103	111	75-133	7	30	
Xylene (Total)	ug/L	<0.24	60	60	61.5	62.7	103	105	63-142	2	30	
1,2-Dichloroethane-d4 (S)	%						94	90	75-137			
4-Bromofluorobenzene (S)	%						97	98	75-125			
Toluene-d8 (S)	%						95	95	75-125			

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### WORKORDER QUALIFIERS

WO: 10403564

[1] The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403564

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10403564001	THORSON-GW-091217	EPA 8260B	498194		

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403564

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: UPRR		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Theriault (atheria@up.com)	
Address: 1400 W. 52nd Ave. Denver, CO 80221		Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com		Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221	
Email: atheria@up.com		Purchase Order #		Pace Quote: Contract# 758938	
Phone: Fax:		Project Name: Freeman, WA - Cenex Harvest Lease		Pace Project Manager: Jennifer Gross	
Requested Due Date: 24 Hr / 3 Day / 10 Day		Project #:		Pace Profile #: 36447 / 4	
				Regulatory Agency	
				State/Location	
				WA / Freeman	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N Analytes Test	Requested Analysis Filtered (Y/N)				Notes		
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8280	6020 Total Iron	6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus			
				DATE	TIME	DATE	TIME																
1	THORSON-GW-091217	WTG	G			9-12-17	1420	3						X								001	
2	TB-091217	WTG	G			9-12-17	0700	2						X								Trip Blank	
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
*Field filtered by client	JK/CH2M	9-15-17	1144	[Signature]	9/15/17	855	2.9	7	7
							3.3		
							5.4		

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: L K Baumann					
SIGNATURE OF SAMPLER: [Signature]					



Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.23**

Document Revised: 30Aug2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: LRR Project #: \_\_\_\_\_

**WO# : 10403564**  
  
 10403564  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
 Tracking Number: 70145755372, 70145755381, 70145755418,  
70145753780, 70145755391  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS  
 Thermometer  151401163  G87A9155100842  
 Used: \_\_\_\_\_  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 2.2, 3.0, 4.1, 1.7, 5.9 Cooler Temp Corrected (°C): 2.4, 3.4, 3.9, 0.7, 5.4  
 Temp should be above freezing to 6°C Correction Factor: 10.2, 10.5 Date and Initials of Person Examining Contents: 9/16/17

USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>W1</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>trip blanks 1/4 66915</u>
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Should trip blanks 10403559</u>
Pace Trip Blank Lot # (if purchased): <u>N/A</u>		

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: CH2M Hill staff Date/Time: 9/18/17

Comments/Resolution: Notified of headspace.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1355</u> Temp: <u>2.2, 5.4</u>	Corrected Temp: <u>2.4, 5.4</u>
Time: <u>1410</u> put in cooler	Corrected Temp: <u>5.4</u>
Time: _____ Temp: _____	Corrected Temp: _____

Project Manager Review: Amanda J Albrecht Date: 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 22, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

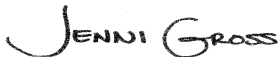
RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10403565

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403565001	Silva-GW-091217	Water	09/12/17 13:35	09/16/17 08:55

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403565001	Silva-GW-091217	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403565001</b>	<b>Silva-GW-091217</b>					
EPA 8260B	Acetone	21.4	ug/L	20.0	09/22/17 05:39	
EPA 8260B	Carbon tetrachloride	0.98	ug/L	0.50	09/22/17 05:39	

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

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**Date:** September 22, 2017

The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10403565

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**Method:** EPA 8260B  
**Description:** 8260B MSV Low Level  
**Client:** UPRR\_CH2M Hill  
**Date:** September 22, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 498194

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2708552)
  - Bromomethane
- LCS (Lab ID: 2708553)
  - Bromomethane
- MS (Lab ID: 2708554)
  - Bromomethane
- MSD (Lab ID: 2708555)
  - Bromomethane
- Silva-GW-091217 (Lab ID: 10403565001)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 22, 2017

QC Batch: 498194

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404181007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708554)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Acetone
  - Carbon tetrachloride

### Additional Comments:

Analyte Comments:

QC Batch: 498194

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2708554)
  - Carbon tetrachloride
- MSD (Lab ID: 2708555)
  - Carbon tetrachloride

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

Sample: **Silva-GW-091217** Lab ID: **10403565001** Collected: 09/12/17 13:35 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		09/22/17 05:39	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 05:39	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/22/17 05:39	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/22/17 05:39	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/22/17 05:39	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:39	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:39	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/22/17 05:39	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:39	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/22/17 05:39	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/22/17 05:39	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/22/17 05:39	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/22/17 05:39	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/22/17 05:39	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/22/17 05:39	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/22/17 05:39	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/22/17 05:39	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 05:39	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/22/17 05:39	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/22/17 05:39	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/22/17 05:39	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/22/17 05:39	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/22/17 05:39	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/22/17 05:39	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/22/17 05:39	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/22/17 05:39	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/22/17 05:39	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/22/17 05:39	108-10-1	
Acetone	21.4	ug/L	20.0	8.8	1		09/22/17 05:39	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/22/17 05:39	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/22/17 05:39	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/22/17 05:39	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/22/17 05:39	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 05:39	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/22/17 05:39	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/22/17 05:39	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/22/17 05:39	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/22/17 05:39	75-15-0	
Carbon tetrachloride	0.98	ug/L	0.50	0.20	1		09/22/17 05:39	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/22/17 05:39	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/22/17 05:39	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/22/17 05:39	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		09/22/17 05:39	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

Sample: **Silva-GW-091217** Lab ID: **10403565001** Collected: 09/12/17 13:35 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/22/17 05:39	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/22/17 05:39	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/22/17 05:39	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/22/17 05:39	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/22/17 05:39	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/22/17 05:39	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/22/17 05:39	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/22/17 05:39	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/22/17 05:39	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/22/17 05:39	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/22/17 05:39	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/22/17 05:39	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/22/17 05:39	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/22/17 05:39	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/22/17 05:39	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/22/17 05:39	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/22/17 05:39	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/22/17 05:39	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/22/17 05:39	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/22/17 05:39	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 05:39	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/22/17 05:39	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/22/17 05:39	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/22/17 05:39	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/22/17 05:39	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/22/17 05:39	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/22/17 05:39	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/22/17 05:39	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		09/22/17 05:39	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/22/17 05:39	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		09/22/17 05:39	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		09/22/17 05:39	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		09/22/17 05:39	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

QC Batch: 498194

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10403565001

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403565001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/21/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/21/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/21/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/21/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/21/17 23:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/21/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/21/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/21/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/21/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/21/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/21/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/21/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/21/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/21/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/21/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	09/21/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	09/21/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/21/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	09/21/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	09/21/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/21/17 23:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

METHOD BLANK: 2708552

Matrix: Water

Associated Lab Samples: 10403565001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	09/21/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	09/21/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	09/21/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/21/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Dibromochloromethane	ug/L	<0.13	1.0	0.13	09/21/17 23:24	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	09/21/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/21/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/21/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/21/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/21/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/21/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/21/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	09/21/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	09/21/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
Styrene	ug/L	<0.14	0.50	0.14	09/21/17 23:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/21/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/21/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/21/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/21/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/21/17 23:24	
Toluene	ug/L	<0.17	0.50	0.17	09/21/17 23:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/21/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	09/21/17 23:24	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/21/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/21/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/21/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/21/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/21/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/21/17 23:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		09/21/17 23:24	
4-Bromofluorobenzene (S)	%	100	75-125		09/21/17 23:24	
Toluene-d8 (S)	%	95	75-125		09/21/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.7	98	75-136	
1,1,1-Trichloroethane	ug/L	20	19.0	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	23.3	116	71-138	
1,1,2-Trichloroethane	ug/L	20	21.4	107	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.0	85	69-126	
1,1-Dichloroethane	ug/L	20	18.8	94	75-125	
1,1-Dichloroethene	ug/L	20	18.1	91	75-125	
1,1-Dichloropropene	ug/L	20	17.8	89	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.6	103	75-125	
1,2,3-Trichloropropane	ug/L	20	22.3	111	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.2	106	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	55.9	112	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	18.5	92	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	93	75-125	
1,2-Dichloropropane	ug/L	20	20.0	100	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.6	98	75-125	
1,3-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,3-Dichloropropane	ug/L	20	20.6	103	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	390	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	13.7	69	68-125	
2,2-Dichloropropane	ug/L	20	16.5	82	70-131	
2-Butanone (MEK)	ug/L	100	113	113	69-125	
2-Chlorotoluene	ug/L	20	19.9	99	75-125	
2-Hexanone	ug/L	100	121	121	73-129	
4-Chlorotoluene	ug/L	20	19.7	98	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	116	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	231	115	68-129	
Benzene	ug/L	20	18.5	92	75-125	
Bromobenzene	ug/L	20	19.9	99	75-125	
Bromochloromethane	ug/L	20	19.3	97	75-126	
Bromodichloromethane	ug/L	20	19.9	100	75-133	
Bromoform	ug/L	20	20.2	101	62-142	
Bromomethane	ug/L	20	7.2	36	34-143	CL
Carbon disulfide	ug/L	20	16.6	83	71-125	
Carbon tetrachloride	ug/L	20	18.5	92	71-145	
Chlorobenzene	ug/L	20	20.9	104	75-125	
Chloroethane	ug/L	20	20.9	104	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	17.5	88	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

LABORATORY CONTROL SAMPLE: 2708553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	18.7	94	74-141	
Dibromomethane	ug/L	20	22.1	110	75-125	
Dichlorodifluoromethane	ug/L	20	19.0	95	59-130	
Dichlorofluoromethane	ug/L	20	17.9	89	75-125	
Diisopropyl ether	ug/L	20	21.2	106	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.6	93	73-125	
Ethylbenzene	ug/L	20	19.7	98	75-125	
Hexachloro-1,3-butadiene	ug/L	20	19.4	97	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.4	97	75-125	
m&p-Xylene	ug/L	40	40.0	100	75-125	
Methyl-tert-butyl ether	ug/L	20	18.5	93	75-125	
Methylene Chloride	ug/L	20	17.3	86	73-125	
n-Butylbenzene	ug/L	20	19.1	96	75-125	
n-Propylbenzene	ug/L	20	19.9	100	75-125	
Naphthalene	ug/L	20	20.1	100	74-125	
o-Xylene	ug/L	20	19.9	100	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	19.2	96	75-125	
Styrene	ug/L	20	18.2	91	75-125	
tert-Amylmethyl ether	ug/L	20	18.6	93	71-126	
tert-Butyl Alcohol	ug/L	200	243	121	69-131	
tert-Butylbenzene	ug/L	20	19.0	95	75-125	
Tetrachloroethene	ug/L	20	19.0	95	75-125	
Tetrahydrofuran	ug/L	200	204	102	65-127	
Toluene	ug/L	20	19.6	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.6	93	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.6	88	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.0	80	30-150	
Trichloroethene	ug/L	20	20.3	101	75-125	
Trichlorofluoromethane	ug/L	20	20.6	103	71-140	
Vinyl acetate	ug/L	20	22.8	114	68-137	
Vinyl chloride	ug/L	20	19.6	98	70-125	
Xylene (Total)	ug/L	60	59.9	100	75-125	
1,2-Dichloroethane-d4 (S)	%			89	75-137	
4-Bromofluorobenzene (S)	%			96	75-125	
Toluene-d8 (S)	%			95	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554 2708555

Parameter	Units	10404181007		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	20	19.9	20.4	99	102	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	20	20	21.3	21.0	106	105	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	20	22.6	23.3	113	116	60-142	3	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20	20	20.2	20.3	101	102	75-128	1	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

Parameter	Units	2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	19.9	20.0	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.2	19.3	96	96	70-129	0	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.3	20.2	101	101	67-141	0	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.9	20.0	99	100	64-144	1	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.0	21.8	105	109	66-139	4	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	21.2	21.8	106	109	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.9	21.4	105	107	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	20.0	20.4	100	102	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	55.2	56.3	110	113	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	19.5	94	98	74-129	4	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.3	20.9	102	104	68-135	3	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	18.6	18.9	93	94	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	39.2	38.8	98	97	69-134	1	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.6	20.6	103	103	64-130	0	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.5	21.0	103	105	64-146	2	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.8	20.6	99	103	69-135	4	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.3	19.5	96	97	67-128	1	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	20.6	99	103	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	399	392	100	98	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.1	16.9	81	85	48-150	5	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	17.5	17.1	88	85	50-150	2	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	115	116	115	116	58-125	1	30		
2-Chlorotoluene	ug/L	<0.20	20	20	20.0	20.5	100	103	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	119	120	119	120	61-134	1	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.2	20.0	96	100	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	115	117	115	117	61-130	2	30		
Acetone	ug/L	13.1J	100	100	160	164	147	151	51-140	2	30	M1	
Acrolein	ug/L	<4.8	200	200	198	205	99	103	48-150	3	30		
Acrylonitrile	ug/L	<4.9	200	200	212	214	106	107	55-134	1	30		
Benzene	ug/L	<0.13	20	20	19.4	19.0	97	95	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	19.4	20.3	97	101	67-138	5	30		
Bromochloromethane	ug/L	<0.38	20	20	19.0	19.1	95	95	66-138	1	30		
Bromodichloromethane	ug/L	<0.20	20	20	20.2	20.5	101	102	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	19.6	20.4	98	102	65-129	4	30		
Bromomethane	ug/L	<1.5	20	20	9.0	11.2	45	56	41-150	22	30	CL	
Carbon disulfide	ug/L	0.49J	20	20	17.9	17.6	87	85	72-132	2	30		
Carbon tetrachloride	ug/L	126	20	20	137	134	51	40	75-150	2	30	E,M1	
Chlorobenzene	ug/L	<0.14	20	20	20.2	20.6	101	103	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	20.8	22.1	104	110	74-138	6	30		
Chloroform	ug/L	9.5	20	20	27.6	27.3	91	89	74-125	1	30		
Chloromethane	ug/L	<1.1	20	20	17.7	18.5	89	93	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.4	19.1	97	96	63-135	1	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	18.8	18.9	94	94	66-129	1	30		
Dibromochloromethane	ug/L	<0.13	20	20	18.0	18.5	90	93	75-133	3	30		

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708554		2708555		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10404181007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<0.50	20	20	21.5	21.4	108	107	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.31	20	20	20.1	22.2	101	111	72-150	10	30		
Dichlorofluoromethane	ug/L	<0.38	20	20	17.9	18.7	89	94	75-129	5	30		
Diisopropyl ether	ug/L	<0.12	20	20	20.9	20.5	105	103	62-128	2	30		
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	18.8	18.6	94	93	63-132	1	30		
Ethylbenzene	ug/L	<0.14	20	20	20.2	20.5	101	102	72-130	1	30		
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	19.7	20.2	99	101	71-150	2	30		
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.0	20.5	100	103	70-136	3	30		
m&p-Xylene	ug/L	<0.24	40	40	40.9	41.5	102	104	64-142	2	30		
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.2	18.1	91	90	72-125	1	30		
Methylene Chloride	ug/L	<1.2	20	20	17.1	16.7	85	84	60-132	2	30		
n-Butylbenzene	ug/L	<0.13	20	20	20.4	21.0	102	105	60-150	3	30		
n-Propylbenzene	ug/L	<0.12	20	20	21.2	22.0	106	110	63-142	4	30		
Naphthalene	ug/L	<0.42	20	20	20.6	21.5	103	107	67-125	4	30		
o-Xylene	ug/L	<0.11	20	20	20.7	21.2	103	106	60-143	2	30		
p-Isopropyltoluene	ug/L	<0.14	20	20	18.7	19.2	94	96	64-146	3	30		
sec-Butylbenzene	ug/L	<0.12	20	20	20.5	21.2	103	106	67-144	3	30		
Styrene	ug/L	<0.14	20	20	18.1	18.4	90	92	67-136	2	30		
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.0	17.9	90	89	60-134	1	30		
tert-Butyl Alcohol	ug/L	<2.2	200	200	226	229	113	115	56-146	1	30		
tert-Butylbenzene	ug/L	<0.15	20	20	20.1	20.7	101	103	68-135	3	30		
Tetrachloroethene	ug/L	<0.16	20	20	19.4	20.0	97	100	67-148	3	30		
Tetrahydrofuran	ug/L	<4.3	200	200	230	240	115	120	51-141	4	30		
Toluene	ug/L	<0.17	20	20	19.4	19.8	97	99	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.8	19.7	99	98	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	17.3	17.7	87	89	67-134	2	30		
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	40.0	41.9	80	84	30-150	5	30		
Trichloroethene	ug/L	<0.18	20	20	22.0	21.8	110	109	64-149	1	30		
Trichlorofluoromethane	ug/L	<0.13	20	20	22.0	23.4	110	117	75-150	6	30		
Vinyl acetate	ug/L	<1.5	20	20	20.9	20.6	105	103	49-143	2	30		
Vinyl chloride	ug/L	<0.096	20	20	20.6	22.1	103	111	75-133	7	30		
Xylene (Total)	ug/L	<0.24	60	60	61.5	62.7	103	105	63-142	2	30		
1,2-Dichloroethane-d4 (S)	%						94	90	75-137				
4-Bromofluorobenzene (S)	%						97	98	75-125				
Toluene-d8 (S)	%						95	95	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### WORKORDER QUALIFIERS

WO: 10403565

[1] The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

---

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403565

---

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10403565001	Silva-GW-091217	EPA 8260B	498194		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1040 3565 BC  
~~1040 3559~~ 9-16-17

**Section A**

**Required Client Information:**

Company:	UPRR
Address:	1400 W. 52nd Ave. Denver, CO 80221
Email:	athelia@up.com
Phone:	
Requested Due Date:	24 Hr / 3 Day / <b>10 Day</b>

**Section B**

**Required Project Information:**

Report To:	Mark Ochsner, Brad Ostapkowicz
Copy To:	Steve Demus, Lindsey Baumann David Hodson, UPRR-Sysdat@ghd.com
Purchase Order #	
Project Name:	Freeman, WA - Cenex Harvest Lease
Project #:	

**Section C**

**Invoice Information:**

Attention:	Anne Theriault (athelia@up.com)
Company:	UPRR
Address:	1400 W. 52nd Ave, Denver, CO 80221
Pace Quote:	Contract# 758938
Pace Project Manager:	Jennifer Gross
Pace Profile #:	36447 / 4

Page :	1	Of	1
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ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT VWV P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					ANALYSES TEST	Requested Analysis Filtered (Y/N)			Regulatory Agency	State / Location WA / Freeman				
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate		Other	Low Level VOCs by 8260	6020 Total Iron			6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus		
						DATE	TIME	DATE	TIME																	
1	Silva-GW-091217			WTG				9/12/17	1335	3														001		
2	TB-091217			LT				L	0700	2				X										Trip Blank		
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*Field filtered by client	ZKB/CH2M	9-15-17	11:36	[Signature]	9/16/17	855	2.4 2.4 3.3 3.7 5.4 7 7 7

SAMPLER NAME AND SIGNATURE			TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	L K Baumann						
SIGNATURE of SAMPLER:	[Signature]	DATE Signed:	9-15-17				



Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.23**

Document Revised: 30Aug2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: UPRR Project #: \_\_\_\_\_

**WO# : 10403565**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 702145755392, 702145755389, 702145755418,  
702145755380, 702145755391  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS  
 Thermometer Used:  151401163  G87A9155100842  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Cooler Temp Read (°C): 2.2, 2.0, 4.1, 1.2, 5.9 Cooler Temp Corrected (°C): 2.4, 3.4, 3.9, 0.7, 5.4  
 Temp should be above freezing to 6°C Correction Factor: 10.2, 10.8 Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Temp Blank?  Yes  No  
 Biological Tissue Frozen?  Yes  No  N/A  
 Date and Initials of Person Examining Contents: OT 9/16/17

USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>Sample out 3/365H, trip blanks 4/4 V59H</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>Should trip blank be 10403559</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>N/A</u>	

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No

Person Contacted: CH2M Hill staff Date/Time: 9/18/17

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1255</u> Temp: <u>1.2, 5.4</u>	Corrected Temp: <u>3.9, 5.1</u>
Time: <u>1410</u> put in cooler	Corrected Temp: <u>5.4</u>
Time: _____ Temp: _____	Corrected Temp: _____

Notified of headspace.

Project Manager Review: Amanda J. Albrecht Date: 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 27, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

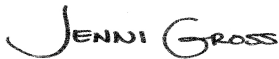
RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10403566

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10403566001	MW2D-GW-091417	Water	09/14/17 09:30	09/16/17 08:55
10403566002	MW14D-GW-091417	Water	09/14/17 13:05	09/16/17 08:55
10403566003	MW3D-GW-091417	Water	09/14/17 14:50	09/16/17 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10403566001	MW2D-GW-091417	EPA 8260B	DJB	83	PASI-M
10403566002	MW14D-GW-091417	EPA 8260B	DJB	83	PASI-M
10403566003	MW3D-GW-091417	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10403566001</b>	<b>MW2D-GW-091417</b>					
EPA 8260B	Acetone	46.8	ug/L	20.0	09/26/17 15:54	
EPA 8260B	Benzene	0.34J	ug/L	0.50	09/26/17 15:54	
EPA 8260B	Toluene	0.35J	ug/L	0.50	09/26/17 15:54	
EPA 8260B	tert-Butyl Alcohol	2.3J	ug/L	10.0	09/26/17 15:54	
<b>10403566003</b>	<b>MW3D-GW-091417</b>					
EPA 8260B	Acetone	12.5J	ug/L	20.0	09/26/17 17:05	

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

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**Date:** September 27, 2017

The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 27, 2017

**General Information:**

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498839

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Sample: MW2D-GW-091417 Lab ID: 10403566001 Collected: 09/14/17 09:30 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 15:54	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 15:54	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 15:54	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 15:54	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:54	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:54	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 15:54	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:54	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 15:54	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 15:54	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 15:54	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 15:54	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 15:54	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 15:54	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 15:54	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:54	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 15:54	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 15:54	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 15:54	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 15:54	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 15:54	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 15:54	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 15:54	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 15:54	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 15:54	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 15:54	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 15:54	108-10-1	
Acetone	46.8	ug/L	20.0	8.8	1		09/26/17 15:54	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 15:54	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 15:54	107-13-1	
Benzene	0.34J	ug/L	0.50	0.13	1		09/26/17 15:54	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 15:54	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 15:54	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 15:54	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 15:54	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 15:54	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/26/17 15:54	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/26/17 15:54	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 15:54	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/26/17 15:54	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 15:54	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 15:54	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

**Sample:** MW2D-GW-091417      **Lab ID:** 10403566001      Collected: 09/14/17 09:30      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 15:54	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 15:54	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 15:54	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 15:54	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 15:54	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 15:54	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 15:54	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 15:54	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 15:54	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 15:54	109-99-9	
Toluene	0.35J	ug/L	0.50	0.17	1		09/26/17 15:54	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 15:54	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 15:54	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 15:54	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 15:54	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 15:54	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 15:54	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 15:54	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 15:54	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 15:54	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 15:54	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 15:54	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 15:54	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 15:54	994-05-8	
tert-Butyl Alcohol	2.3J	ug/L	10.0	2.2	1		09/26/17 15:54	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 15:54	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 15:54	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:54	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 15:54	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		09/26/17 15:54	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		09/26/17 15:54	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		09/26/17 15:54	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Sample: MW14D-GW-091417 Lab ID: 10403566002 Collected: 09/14/17 13:05 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 16:18	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 16:18	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 16:18	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 16:18	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 16:18	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 16:18	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 16:18	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 16:18	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 16:18	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 16:18	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 16:18	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 16:18	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 16:18	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 16:18	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 16:18	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 16:18	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 16:18	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 16:18	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 16:18	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 16:18	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 16:18	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 16:18	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 16:18	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 16:18	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 16:18	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		09/26/17 16:18	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 16:18	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 16:18	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 16:18	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 16:18	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 16:18	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 16:18	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 16:18	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/26/17 16:18	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/26/17 16:18	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 16:18	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/26/17 16:18	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 16:18	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	124-48-1	

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

**Sample: MW14D-GW-091417**      **Lab ID: 10403566002**      Collected: 09/14/17 13:05      Received: 09/16/17 08:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 16:18	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 16:18	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 16:18	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 16:18	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 16:18	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 16:18	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 16:18	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 16:18	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 16:18	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/26/17 16:18	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 16:18	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 16:18	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 16:18	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 16:18	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 16:18	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 16:18	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 16:18	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 16:18	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 16:18	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 16:18	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 16:18	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 16:18	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/26/17 16:18	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 16:18	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 16:18	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 16:18	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 16:18	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	108	%	75-137		1		09/26/17 16:18	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		09/26/17 16:18	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		09/26/17 16:18	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Sample: **MW3D-GW-091417** Lab ID: **10403566003** Collected: 09/14/17 14:50 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 17:05	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 17:05	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 17:05	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 17:05	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:05	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:05	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 17:05	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:05	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 17:05	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 17:05	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 17:05	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 17:05	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 17:05	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 17:05	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 17:05	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:05	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:05	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 17:05	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 17:05	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 17:05	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 17:05	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 17:05	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 17:05	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 17:05	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 17:05	108-10-1	
Acetone	12.5J	ug/L	20.0	8.8	1		09/26/17 17:05	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 17:05	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 17:05	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:05	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 17:05	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 17:05	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 17:05	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 17:05	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/26/17 17:05	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/26/17 17:05	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 17:05	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/26/17 17:05	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 17:05	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

Sample: MW3D-GW-091417 Lab ID: 10403566003 Collected: 09/14/17 14:50 Received: 09/16/17 08:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 17:05	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 17:05	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 17:05	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 17:05	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 17:05	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 17:05	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 17:05	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:05	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 17:05	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/26/17 17:05	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 17:05	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 17:05	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 17:05	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 17:05	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 17:05	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:05	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 17:05	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:05	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:05	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 17:05	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:05	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 17:05	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/26/17 17:05	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 17:05	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 17:05	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:05	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 17:05	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	109	%	75-137		1		09/26/17 17:05	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1		09/26/17 17:05	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		09/26/17 17:05	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

QC Batch: 498839 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10403566001, 10403566002, 10403566003

METHOD BLANK: 2712331 Matrix: Water

Associated Lab Samples: 10403566001, 10403566002, 10403566003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/26/17 12:00	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/26/17 12:00	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/26/17 12:00	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/26/17 12:00	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/26/17 12:00	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/26/17 12:00	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/26/17 12:00	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/26/17 12:00	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/26/17 12:00	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/26/17 12:00	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/26/17 12:00	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/26/17 12:00	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/26/17 12:00	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/26/17 12:00	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/26/17 12:00	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/26/17 12:00	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/26/17 12:00	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/26/17 12:00	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/26/17 12:00	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/26/17 12:00	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/26/17 12:00	
Acetone	ug/L	<8.8	20.0	8.8	09/26/17 12:00	
Acrolein	ug/L	<4.8	10.0	4.8	09/26/17 12:00	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/26/17 12:00	
Benzene	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/26/17 12:00	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/26/17 12:00	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/26/17 12:00	
Bromoform	ug/L	<1.0	4.0	1.0	09/26/17 12:00	
Bromomethane	ug/L	<1.5	4.0	1.5	09/26/17 12:00	
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/26/17 12:00	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/26/17 12:00	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

METHOD BLANK: 2712331

Matrix: Water

Associated Lab Samples: 10403566001, 10403566002, 10403566003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
Chloroethane	ug/L	<0.44	1.0	0.44	09/26/17 12:00	
Chloroform	ug/L	<0.46	1.0	0.46	09/26/17 12:00	
Chloromethane	ug/L	<1.1	4.0	1.1	09/26/17 12:00	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/26/17 12:00	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Dibromomethane	ug/L	<0.50	1.0	0.50	09/26/17 12:00	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/26/17 12:00	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/26/17 12:00	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/26/17 12:00	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/26/17 12:00	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/26/17 12:00	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/26/17 12:00	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
Naphthalene	ug/L	<0.42	1.0	0.42	09/26/17 12:00	
o-Xylene	ug/L	<0.11	0.50	0.11	09/26/17 12:00	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
Styrene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/26/17 12:00	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/26/17 12:00	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/26/17 12:00	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/26/17 12:00	
Toluene	ug/L	<0.17	0.50	0.17	09/26/17 12:00	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/26/17 12:00	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/26/17 12:00	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/26/17 12:00	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/26/17 12:00	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/26/17 12:00	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/26/17 12:00	
1,2-Dichloroethane-d4 (S)	%	107	75-137		09/26/17 12:00	
4-Bromofluorobenzene (S)	%	101	75-125		09/26/17 12:00	
Toluene-d8 (S)	%	106	75-125		09/26/17 12:00	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

LABORATORY CONTROL SAMPLE & LCSD: 2712332		2712333								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.4	19.8	102	99	75-136	3	30	
1,1,1-Trichloroethane	ug/L	20	20.2	19.3	101	97	75-129	5	30	
1,1,2,2-Tetrachloroethane	ug/L	20	20.8	20.7	104	103	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	20.9	20.4	105	102	75-125	3	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.0	19.1	100	96	69-126	4	30	
1,1-Dichloroethane	ug/L	20	20.0	19.7	100	99	75-125	2	30	
1,1-Dichloroethene	ug/L	20	20.3	19.2	101	96	75-125	6	30	
1,1-Dichloropropene	ug/L	20	20.0	19.0	100	95	75-125	5	30	
1,2,3-Trichlorobenzene	ug/L	20	20.8	21.7	104	108	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	20.3	20.5	102	102	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	19.8	19.8	99	99	75-125	0	30	
1,2,4-Trimethylbenzene	ug/L	20	21.1	20.7	105	104	75-125	2	30	
1,2-Dibromo-3-chloropropane	ug/L	50	49.4	50.8	99	102	71-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.9	20.4	104	102	75-125	2	30	
1,2-Dichlorobenzene	ug/L	20	20.3	20.2	102	101	75-125	0	30	
1,2-Dichloroethane	ug/L	20	18.5	18.1	93	91	70-125	2	30	
1,2-Dichloroethene (Total)	ug/L	40	39.5	37.8	99	95	75-125	4	30	
1,2-Dichloropropane	ug/L	20	19.3	18.8	97	94	75-125	2	30	
1,3,5-Trimethylbenzene	ug/L	20	21.7	21.2	109	106	75-125	2	30	
1,3-Dichlorobenzene	ug/L	20	21.0	20.4	105	102	75-125	3	30	
1,3-Dichloropropane	ug/L	20	20.6	20.6	103	103	75-125	0	30	
1,4-Dichlorobenzene	ug/L	20	20.6	20.0	103	100	75-125	3	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	410	394	103	99	64-140	4	30	
2,2,4-Trimethylpentane	ug/L	20	20.8	19.3	104	97	68-125	7	30	
2,2-Dichloropropane	ug/L	20	20.4	19.8	102	99	70-131	3	30	
2-Butanone (MEK)	ug/L	100	91.8	94.5	92	95	69-125	3	30	
2-Chlorotoluene	ug/L	20	21.7	21.2	109	106	75-125	3	30	
2-Hexanone	ug/L	100	108	106	108	106	73-129	2	30	
4-Chlorotoluene	ug/L	20	21.9	20.8	109	104	75-125	5	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	106	104	106	104	73-125	2	30	
Acetone	ug/L	100	97.1	92.1	97	92	66-126	5	30	
Acrolein	ug/L	200	161	165	80	83	56-150	3	30	
Acrylonitrile	ug/L	200	201	198	100	99	68-129	1	30	
Benzene	ug/L	20	19.2	18.6	96	93	75-125	3	30	
Bromobenzene	ug/L	20	21.2	20.7	106	104	75-125	3	30	
Bromochloromethane	ug/L	20	19.7	19.1	99	96	75-126	3	30	
Bromodichloromethane	ug/L	20	20.1	19.1	100	95	75-133	5	30	
Bromoform	ug/L	20	19.1	18.5	95	92	62-142	3	30	
Bromomethane	ug/L	20	14.4	16.3	72	82	34-143	13	30	
Carbon disulfide	ug/L	20	19.1	18.3	95	92	71-125	4	30	
Carbon tetrachloride	ug/L	20	20.1	19.4	101	97	71-145	4	30	
Chlorobenzene	ug/L	20	20.5	19.9	102	99	75-125	3	30	
Chloroethane	ug/L	20	20.6	19.9	103	100	75-125	4	30	
Chloroform	ug/L	20	19.0	18.4	95	92	75-125	4	30	
Chloromethane	ug/L	20	18.1	16.7	91	84	54-125	8	30	
cis-1,2-Dichloroethene	ug/L	20	19.9	18.9	99	95	75-125	5	30	
cis-1,3-Dichloropropene	ug/L	20	19.4	18.9	97	95	75-125	2	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

LABORATORY CONTROL SAMPLE & LCSD:		2712332		2712333							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.6	19.9	103	99	74-141	3	30		
Dibromomethane	ug/L	20	20.1	19.5	101	98	75-125	3	30		
Dichlorodifluoromethane	ug/L	20	18.7	18.1	93	90	59-130	4	30		
Dichlorofluoromethane	ug/L	20	19.5	18.9	98	95	75-125	3	30		
Diisopropyl ether	ug/L	20	19.0	18.9	95	95	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.4	19.4	97	97	73-125	0	30		
Ethylbenzene	ug/L	20	21.0	20.0	105	100	75-125	5	30		
Hexachloro-1,3-butadiene	ug/L	20	20.7	21.4	104	107	75-131	3	30		
Isopropylbenzene (Cumene)	ug/L	20	21.2	19.8	106	99	75-125	7	30		
m&p-Xylene	ug/L	40	42.8	41.0	107	102	75-125	4	30		
Methyl-tert-butyl ether	ug/L	20	19.0	19.1	95	96	75-125	0	30		
Methylene Chloride	ug/L	20	18.7	18.6	93	93	73-125	0	30		
n-Butylbenzene	ug/L	20	21.6	20.8	108	104	75-125	4	30		
n-Propylbenzene	ug/L	20	21.5	20.9	108	104	75-125	3	30		
Naphthalene	ug/L	20	18.3	19.5	92	97	74-125	6	30		
o-Xylene	ug/L	20	20.9	19.9	105	100	75-125	5	30		
p-Isopropyltoluene	ug/L	20	20.7	19.6	104	98	75-125	5	30		
sec-Butylbenzene	ug/L	20	21.4	20.7	107	103	75-125	3	30		
Styrene	ug/L	20	19.2	18.7	96	93	75-125	3	30		
tert-Amylmethyl ether	ug/L	20	19.3	19.2	96	96	71-126	1	30		
tert-Butyl Alcohol	ug/L	200	204	204	102	102	69-131	0	30		
tert-Butylbenzene	ug/L	20	21.2	20.6	106	103	75-125	3	30		
Tetrachloroethene	ug/L	20	20.6	19.7	103	99	75-125	4	30		
Tetrahydrofuran	ug/L	200	194	180	97	90	65-127	8	30		
Toluene	ug/L	20	20.1	19.1	100	96	75-125	5	30		
trans-1,2-Dichloroethene	ug/L	20	19.7	18.9	98	95	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	20	19.3	18.8	97	94	75-125	3	30		
trans-1,4-Dichloro-2-butene	ug/L	50	47.9	49.6	96	99	30-150	4	30		
Trichloroethene	ug/L	20	19.8	19.1	99	95	75-125	4	30		
Trichlorofluoromethane	ug/L	20	20.5	20.0	102	100	71-140	3	30		
Vinyl acetate	ug/L	20	20.0	20.2	100	101	68-137	1	30		
Vinyl chloride	ug/L	20	20.1	19.2	100	96	70-125	4	30		
Xylene (Total)	ug/L	60	63.7	60.9	106	101	75-125	5	30		
1,2-Dichloroethane-d4 (S)	%				103	104	75-137				
4-Bromofluorobenzene (S)	%				98	101	75-125				
Toluene-d8 (S)	%				106	105	75-125				

MATRIX SPIKE SAMPLE:		2712364		10403566001							
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20.3	101	75-137					
1,1,1-Trichloroethane	ug/L	<0.15	20	21.4	107	75-139					
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20.6	103	60-142					
1,1,2-Trichloroethane	ug/L	<0.22	20	20.5	102	75-128					
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	22.9	114	62-150					

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

MATRIX SPIKE SAMPLE: 2712364		10403566001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	20.8	104	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	21.5	108	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	21.3	106	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	22.9	114	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	20.0	100	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	21.2	106	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	21.2	106	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	48.8	98	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20.7	103	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	20.0	100	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	18.3	91	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40.9	102	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	19.6	98	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	21.9	109	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	20.6	103	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	20.5	102	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	20.3	102	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	389	97	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	26.7	133	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	21.4	107	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	89.9	90	58-125	
2-Chlorotoluene	ug/L	<0.20	20	20.5	103	65-138	
2-Hexanone	ug/L	<2.5	100	105	105	61-134	
4-Chlorotoluene	ug/L	<0.13	20	21.3	107	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	104	104	61-130	
Acetone	ug/L	46.8	100	162	115	51-140	
Acrolein	ug/L	<4.8	200	221	111	48-150	
Acrylonitrile	ug/L	<4.9	200	193	97	55-134	
Benzene	ug/L	0.34J	20	19.9	98	63-132	
Bromobenzene	ug/L	<0.16	20	20.5	103	67-138	
Bromochloromethane	ug/L	<0.38	20	19.6	98	66-138	
Bromodichloromethane	ug/L	<0.20	20	20.1	101	75-137	
Bromoform	ug/L	<1.0	20	18.3	91	65-129	
Bromomethane	ug/L	<1.5	20	17.1	86	41-150	
Carbon disulfide	ug/L	<0.37	20	21.0	104	72-132	
Carbon tetrachloride	ug/L	<0.20	20	21.2	106	75-150	
Chlorobenzene	ug/L	<0.14	20	20.5	102	73-127	
Chloroethane	ug/L	<0.44	20	21.2	106	74-138	
Chloroform	ug/L	<0.46	20	18.8	94	74-125	
Chloromethane	ug/L	<1.1	20	19.1	94	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	19.9	99	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	19.3	96	66-129	
Dibromochloromethane	ug/L	<0.13	20	20.4	102	75-133	
Dibromomethane	ug/L	<0.50	20	19.5	97	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	22.0	110	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.3	102	75-129	
Diisopropyl ether	ug/L	<0.12	20	19.5	98	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

MATRIX SPIKE SAMPLE: 2712364

Parameter	Units	10403566001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	19.5	98	63-132	
Ethylbenzene	ug/L	<0.14	20	20.8	103	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	28.8	144	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	21.0	105	70-136	
m&p-Xylene	ug/L	<0.24	40	41.9	104	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	19.5	97	72-125	
Methylene Chloride	ug/L	<1.2	20	19.1	95	60-132	
n-Butylbenzene	ug/L	<0.13	20	23.9	119	60-150	
n-Propylbenzene	ug/L	<0.12	20	21.5	108	63-142	
Naphthalene	ug/L	<0.42	20	19.0	95	67-125	
o-Xylene	ug/L	<0.11	20	20.9	104	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	21.8	109	64-146	
sec-Butylbenzene	ug/L	<0.12	20	22.9	114	67-144	
Styrene	ug/L	<0.14	20	19.0	95	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	19.1	96	60-134	
tert-Butyl Alcohol	ug/L	2.3J	200	203	100	56-146	
tert-Butylbenzene	ug/L	<0.15	20	21.8	109	68-135	
Tetrachloroethene	ug/L	<0.16	20	21.0	105	67-148	
Tetrahydrofuran	ug/L	<4.3	200	251	126	51-141	
Toluene	ug/L	0.35J	20	20.2	100	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	21.0	105	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	19.4	97	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	46.1	92	30-150	
Trichloroethene	ug/L	<0.18	20	20.4	102	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	23.1	116	75-150	
Vinyl acetate	ug/L	<1.5	20	20.2	101	49-143	
Vinyl chloride	ug/L	<0.096	20	22.0	110	75-133	
Xylene (Total)	ug/L	<0.24	60	62.8	105	63-142	
1,2-Dichloroethane-d4 (S)	%				101	75-137	
4-Bromofluorobenzene (S)	%				100	75-125	
Toluene-d8 (S)	%				105	75-125	

SAMPLE DUPLICATE: 2712365

Parameter	Units	10403566002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

SAMPLE DUPLICATE: 2712365

Parameter	Units	10403566002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	18.2J		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

SAMPLE DUPLICATE: 2712365

Parameter	Units	10403566002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	108	107	1		
4-Bromofluorobenzene (S)	%	100	102	2		
Toluene-d8 (S)	%	103	104	1		

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### WORKORDER QUALIFIERS

WO: 10403566

[1] The trip blanks associated with this project are reported with Pace Project #10403559 sample 003 and 10403560 sample 003.

### BATCH QUALIFIERS

Batch: 498839

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10403566

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

---

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10403566

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10403566001	MW2D-GW-091417	EPA 8260B	498839		
10403566002	MW14D-GW-091417	EPA 8260B	498839		
10403566003	MW3D-GW-091417	EPA 8260B	498839		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10403566

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	Page : / Of /
Company: UPRR	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Theriault (atheria@up.com)	Regulatory Agency
Address: 1400 W. 52nd Ave. Denver, CO 80221	Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com	Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221	
Email: atheria@up.com	Purchase Order #	Pace Quote: Contract# 758938	State / Location
Phone: _____ Fax: _____	Project Name: Freeman, WA - Cenex Harvest Lease	Pace Project Manager: Jennifer Gross	WA / Freeman
Requested Due Date: 24 Hr / 3 Day <b>10 Day</b>	Project #:	Pace Profile #: 36447 / 4	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Requested Analysis: Filtered (Y/N)						
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Analyses Test	Low Level VOCs by 8260	6020 Total Iron	6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus		
						DATE	TIME	DATE	TIME																
1	MW20 - GW - 091417	WT				9/14/17	9:30		3							X									001
2	MW140 - GW - 091417						13:05		3							X									002
3	MW30 - GW - 091417						14:50		3							X									003
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
*Field filtered by client	Steve Demus	9/15/17	10:00	[Signature]	9/16/17	8:55	2-4	Y	Y	Y	
							3-9				
							10-7				
							5-4				

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Steve Demus				
SIGNATURE of SAMPLER:	[Signature]	DATE Signed:	9-15-17		



**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** UPRR **Project #:** WO# : 10403566

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

**Tracking Number:** 702145755592, 7021457555381, 7021457555418, 702145755780, 7021457555413

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No

**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: PS **Temp Blank?**  Yes  No

**Thermometer Used:**  151401163  G87A9155100842 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 2.2, 3.0, 4.1, 5.9 **Cooler Temp Corrected (°C):** 2.4, 3.4, 3.9, 4.7, 5.4 **Biological Tissue Frozen?**  Yes  No  N/A

**Temp should be above freezing to 6°C** **Correction Factor:** 1.2, 2.5 **Date and Initials of Person Examining Contents:** 9/16/17

**USDA Regulated Soil**  N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>W1</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: <u>VOA</u> Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>trip blank 4/19 U6761</u>
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>Shared trip blank</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>MIA</u>	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No

Person Contacted: CH2M Hill Staff Date/Time: 9/18/17

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	Notified of headspace.
Opened Time: <u>1355</u> Temp: <u>2.2, 5.0, 4.1</u> Corrected Temp: <u>2.4, 3.4</u>	
Time: <u>1410</u> put in cooler Temp: <u>1.2, 5.9</u> Corrected Temp: <u>3.9, 4.7</u>	
Time: _____ Temp: _____ Corrected Temp: _____	

**Project Manager Review:** Amanda J. Albrecht **Date:** 9/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 04, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

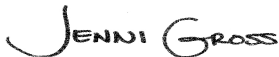
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Alaska Certification UST-107

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Montana Certificate #CERT0103

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification # : 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10404160001	Marlow-GW-091917	Water	09/19/17 13:10	09/21/17 12:45
10404160002	Randall-GW-091917	Water	09/19/17 10:26	09/21/17 12:45
10404160003	FD01-GW-091917	Water	09/19/17 15:00	09/21/17 12:45
10404160004	FD02-GW-091917	Water	09/19/17 15:30	09/21/17 12:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10404160001	Marlow-GW-091917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	KEO	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10404160002	Randall-GW-091917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	KEO	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10404160003	FD01-GW-091917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	KEO	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10404160004	FD02-GW-091917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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**SAMPLE ANALYTE COUNT**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	KEO	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

**REPORT OF LABORATORY ANALYSIS**

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10404160001</b>	<b>Marlow-GW-091917</b>					
RSK 175	Methane	1.4J	ug/L	10.0	09/25/17 11:20	
6010C Met	Barium, Dissolved	29.0	ug/L	10.0	10/02/17 18:53	
6010C Met	Calcium, Dissolved	46900	ug/L	500	10/02/17 18:53	
6010C Met	Copper, Dissolved	22.7	ug/L	10.0	10/02/17 18:53	
6010C Met	Magnesium, Dissolved	14200	ug/L	500	10/02/17 18:53	
6010C Met	Potassium, Dissolved	1430J	ug/L	2500	10/02/17 18:53	
6010C Met	Sodium, Dissolved	13000	ug/L	1000	10/02/17 18:53	
6010C Met	Vanadium, Dissolved	8.8J	ug/L	15.0	10/02/17 18:53	
6010C Met	Zinc, Dissolved	43.2	ug/L	20.0	10/02/17 18:53	B
SM 2320B	Alkalinity, Total as CaCO3	169	mg/L	5.0	10/02/17 14:06	
SM 2540C	Total Dissolved Solids	275	mg/L	10.0	09/25/17 13:53	
EPA 300.0	Chloride	14.7	mg/L	1.2	09/21/17 15:52	M1
EPA 300.0	Nitrate as N	4.2	mg/L	0.10	09/21/17 15:52	M1
EPA 300.0	Sulfate	13.2	mg/L	1.2	09/21/17 15:52	M1
EPA 353.2	Nitrogen, NO2 plus NO3	3.2	mg/L	0.10	09/28/17 15:46	
SM 5310C	Total Organic Carbon	0.66J	mg/L	1.0	09/25/17 22:01	
<b>10404160002</b>	<b>Randall-GW-091917</b>					
6010C Met	Barium, Dissolved	20.4	ug/L	10.0	10/02/17 19:07	
6010C Met	Calcium, Dissolved	45300	ug/L	500	10/02/17 19:07	
6010C Met	Copper, Dissolved	3.0J	ug/L	10.0	10/02/17 19:07	
6010C Met	Magnesium, Dissolved	14900	ug/L	500	10/02/17 19:07	
6010C Met	Manganese, Dissolved	0.75J	ug/L	5.0	10/02/17 19:07	
6010C Met	Potassium, Dissolved	1540J	ug/L	2500	10/02/17 19:07	
6010C Met	Sodium, Dissolved	14600	ug/L	1000	10/02/17 19:07	
6010C Met	Vanadium, Dissolved	6.0J	ug/L	15.0	10/02/17 19:07	
6010C Met	Zinc, Dissolved	31.4	ug/L	20.0	10/02/17 19:07	B
SM 2320B	Alkalinity, Total as CaCO3	196	mg/L	5.0	10/02/17 14:20	
SM 2540C	Total Dissolved Solids	261	mg/L	10.0	09/25/17 13:53	
EPA 300.0	Chloride	5.4	mg/L	1.2	09/21/17 16:07	
EPA 300.0	Nitrate as N	2.5	mg/L	0.10	09/21/17 16:07	M1
EPA 300.0	Sulfate	9.2	mg/L	1.2	09/21/17 16:07	M1
EPA 353.2	Nitrogen, NO2 plus NO3	1.9	mg/L	0.020	09/28/17 15:38	
SM 5310C	Total Organic Carbon	0.48J	mg/L	1.0	09/25/17 22:41	
<b>10404160003</b>	<b>FD01-GW-091917</b>					
RSK 175	Methane	1.5J	ug/L	10.0	09/24/17 10:30	
6010C Met	Aluminum, Dissolved	9.2J	ug/L	200	10/02/17 19:10	
6010C Met	Barium, Dissolved	21.0	ug/L	10.0	10/02/17 19:10	
6010C Met	Calcium, Dissolved	46500	ug/L	500	10/02/17 19:10	
6010C Met	Copper, Dissolved	3.3J	ug/L	10.0	10/02/17 19:10	
6010C Met	Magnesium, Dissolved	15200	ug/L	500	10/02/17 19:10	
6010C Met	Manganese, Dissolved	0.75J	ug/L	5.0	10/02/17 19:10	
6010C Met	Potassium, Dissolved	1580J	ug/L	2500	10/02/17 19:10	
6010C Met	Sodium, Dissolved	15100	ug/L	1000	10/02/17 19:10	
6010C Met	Vanadium, Dissolved	6.1J	ug/L	15.0	10/02/17 19:10	
6010C Met	Zinc, Dissolved	36.4	ug/L	20.0	10/02/17 19:10	B
SM 2320B	Alkalinity, Total as CaCO3	197	mg/L	5.0	10/02/17 14:25	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10404160003</b>	<b>FD01-GW-091917</b>					
SM 2540C	Total Dissolved Solids	271	mg/L	10.0	09/25/17 15:30	
EPA 300.0	Chloride	5.4	mg/L	1.2	09/21/17 15:37	
EPA 300.0	Nitrate as N	2.5	mg/L	0.10	09/21/17 15:37	
EPA 300.0	Sulfate	9.6	mg/L	1.2	09/21/17 15:37	
EPA 353.2	Nitrogen, NO2 plus NO3	1.9	mg/L	0.020	09/28/17 15:39	
SM 5310C	Total Organic Carbon	0.49J	mg/L	1.0	09/25/17 23:20	
<b>10404160004</b>	<b>FD02-GW-091917</b>					
RSK 175	Methane	1.6J	ug/L	10.0	09/24/17 12:10	
6010C Met	Barium, Dissolved	29.3	ug/L	10.0	10/02/17 19:13	
6010C Met	Calcium, Dissolved	47500	ug/L	500	10/02/17 19:13	
6010C Met	Copper, Dissolved	26.8	ug/L	10.0	10/02/17 19:13	
6010C Met	Magnesium, Dissolved	14300	ug/L	500	10/02/17 19:13	
6010C Met	Potassium, Dissolved	1440J	ug/L	2500	10/02/17 19:13	
6010C Met	Sodium, Dissolved	13200	ug/L	1000	10/02/17 19:13	
6010C Met	Vanadium, Dissolved	8.7J	ug/L	15.0	10/02/17 19:13	
6010C Met	Zinc, Dissolved	48.5	ug/L	20.0	10/02/17 19:13	
SM 2320B	Alkalinity, Total as CaCO3	165	mg/L	5.0	10/03/17 09:43	
SM 2540C	Total Dissolved Solids	292	mg/L	10.0	09/25/17 15:30	
EPA 300.0	Chloride	14.7	mg/L	1.2	09/21/17 15:22	
EPA 300.0	Nitrate as N	4.2	mg/L	0.10	09/21/17 15:22	
EPA 300.0	Sulfate	13.2	mg/L	1.2	09/21/17 15:22	
EPA 353.2	Nitrogen, NO2 plus NO3	3.2	mg/L	0.10	09/28/17 15:49	
SM 5310C	Total Organic Carbon	0.67J	mg/L	1.0	09/25/17 23:33	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 498753

B: Analyte was detected in the associated method blank.

- BLANK for HBN 498753 [MPRP/756 (Lab ID: 2712101)
- Zinc, Dissolved

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

### General Information:

4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 500190

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404173002,10404228011

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2719376)
  - Alkalinity, Total as CaCO<sub>3</sub>

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498185

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404160001,10404160002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2708493)
  - Chloride
  - Nitrate as N
  - Sulfate
- MS (Lab ID: 2708495)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2708494)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2708496)
  - Nitrate as N

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

### General Information:

4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 499428

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10404160001,10404353006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2715176)
  - Nitrogen, NO2 plus NO3

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** October 04, 2017

**General Information:**

4 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

**Sample: Marlow-GW-091917**      **Lab ID: 10404160001**      Collected: 09/19/17 13:10      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/25/17 11:20	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/25/17 11:20	74-85-1	
Methane	1.4J	ug/L	10.0	1.1	1		09/25/17 11:20	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/26/17 09:23	10/02/17 18:53	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/26/17 09:23	10/02/17 18:53	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/26/17 09:23	10/02/17 18:53	7440-38-2	
Barium, Dissolved	29.0	ug/L	10.0	0.22	1	09/26/17 09:23	10/02/17 18:53	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/26/17 09:23	10/02/17 18:53	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/26/17 09:23	10/02/17 18:53	7440-43-9	
Calcium, Dissolved	46900	ug/L	500	24.7	1	09/26/17 09:23	10/02/17 18:53	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/26/17 09:23	10/02/17 18:53	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/26/17 09:23	10/02/17 18:53	7440-48-4	
Copper, Dissolved	22.7	ug/L	10.0	0.83	1	09/26/17 09:23	10/02/17 18:53	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/26/17 09:23	10/02/17 18:53	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/26/17 09:23	10/02/17 18:53	7439-92-1	
Magnesium, Dissolved	14200	ug/L	500	2.6	1	09/26/17 09:23	10/02/17 18:53	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	09/26/17 09:23	10/02/17 18:53	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/26/17 09:23	10/02/17 18:53	7440-02-0	
Potassium, Dissolved	1430J	ug/L	2500	126	1	09/26/17 09:23	10/02/17 18:53	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/26/17 09:23	10/02/17 18:53	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/26/17 09:23	10/02/17 18:53	7440-22-4	
Sodium, Dissolved	13000	ug/L	1000	44.6	1	09/26/17 09:23	10/02/17 18:53	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/26/17 09:23	10/02/17 18:53	7440-28-0	
Vanadium, Dissolved	8.8J	ug/L	15.0	0.42	1	09/26/17 09:23	10/02/17 18:53	7440-62-2	
Zinc, Dissolved	43.2	ug/L	20.0	1.8	1	09/26/17 09:23	10/02/17 18:53	7440-66-6	B
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/26/17 08:24	09/26/17 14:36	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	169	mg/L	5.0	1.4	1		10/02/17 14:06		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	275	mg/L	10.0	5.0	1		09/25/17 13:53		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/25/17 16:46	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	14.7	mg/L	1.2	0.14	1		09/21/17 15:52	16887-00-6	M1
Nitrate as N	4.2	mg/L	0.10	0.0079	1		09/21/17 15:52	14797-55-8	M1
Sulfate	13.2	mg/L	1.2	0.27	1		09/21/17 15:52	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Sample: Marlow-GW-091917**      **Lab ID: 10404160001**      Collected: 09/19/17 13:10      Received: 09/21/17 12:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>3.2</b>	mg/L	0.10	0.037	5		09/28/17 15:46		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	09/25/17 10:37	09/25/17 13:48		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.66J</b>	mg/L	1.0	0.20	1		09/25/17 22:01	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

**Sample: Randall-GW-091917**      **Lab ID: 10404160002**      Collected: 09/19/17 10:26      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/24/17 10:23	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/24/17 10:23	74-85-1	
Methane	<1.1	ug/L	10.0	1.1	1		09/24/17 10:23	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/26/17 09:23	10/02/17 19:07	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/26/17 09:23	10/02/17 19:07	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/26/17 09:23	10/02/17 19:07	7440-38-2	
Barium, Dissolved	20.4	ug/L	10.0	0.22	1	09/26/17 09:23	10/02/17 19:07	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/26/17 09:23	10/02/17 19:07	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/26/17 09:23	10/02/17 19:07	7440-43-9	
Calcium, Dissolved	45300	ug/L	500	24.7	1	09/26/17 09:23	10/02/17 19:07	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/26/17 09:23	10/02/17 19:07	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/26/17 09:23	10/02/17 19:07	7440-48-4	
Copper, Dissolved	3.0J	ug/L	10.0	0.83	1	09/26/17 09:23	10/02/17 19:07	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/26/17 09:23	10/02/17 19:07	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/26/17 09:23	10/02/17 19:07	7439-92-1	
Magnesium, Dissolved	14900	ug/L	500	2.6	1	09/26/17 09:23	10/02/17 19:07	7439-95-4	
Manganese, Dissolved	0.75J	ug/L	5.0	0.38	1	09/26/17 09:23	10/02/17 19:07	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/26/17 09:23	10/02/17 19:07	7440-02-0	
Potassium, Dissolved	1540J	ug/L	2500	126	1	09/26/17 09:23	10/02/17 19:07	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/26/17 09:23	10/02/17 19:07	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/26/17 09:23	10/02/17 19:07	7440-22-4	
Sodium, Dissolved	14600	ug/L	1000	44.6	1	09/26/17 09:23	10/02/17 19:07	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/26/17 09:23	10/02/17 19:07	7440-28-0	
Vanadium, Dissolved	6.0J	ug/L	15.0	0.42	1	09/26/17 09:23	10/02/17 19:07	7440-62-2	
Zinc, Dissolved	31.4	ug/L	20.0	1.8	1	09/26/17 09:23	10/02/17 19:07	7440-66-6	B
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/26/17 08:24	09/26/17 14:43	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	196	mg/L	5.0	1.4	1		10/02/17 14:20		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	261	mg/L	10.0	5.0	1		09/25/17 13:53		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/25/17 16:47	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.4	mg/L	1.2	0.14	1		09/21/17 16:07	16887-00-6	
Nitrate as N	2.5	mg/L	0.10	0.0079	1		09/21/17 16:07	14797-55-8	M1
Sulfate	9.2	mg/L	1.2	0.27	1		09/21/17 16:07	14808-79-8	M1

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Sample: Randall-GW-091917**      **Lab ID: 10404160002**      Collected: 09/19/17 10:26      Received: 09/21/17 12:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.9</b>	mg/L	0.020	0.0075	1		09/28/17 15:38		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	09/25/17 10:37	09/25/17 13:49		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.48J</b>	mg/L	1.0	0.20	1		09/25/17 22:41	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

**Sample:** FD01-GW-091917      **Lab ID:** 10404160003      Collected: 09/19/17 15:00      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/24/17 10:30	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/24/17 10:30	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		09/24/17 10:30	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	9.2J	ug/L	200	8.6	1	09/26/17 09:23	10/02/17 19:10	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/26/17 09:23	10/02/17 19:10	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/26/17 09:23	10/02/17 19:10	7440-38-2	
Barium, Dissolved	21.0	ug/L	10.0	0.22	1	09/26/17 09:23	10/02/17 19:10	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/26/17 09:23	10/02/17 19:10	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/26/17 09:23	10/02/17 19:10	7440-43-9	
Calcium, Dissolved	46500	ug/L	500	24.7	1	09/26/17 09:23	10/02/17 19:10	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/26/17 09:23	10/02/17 19:10	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/26/17 09:23	10/02/17 19:10	7440-48-4	
Copper, Dissolved	3.3J	ug/L	10.0	0.83	1	09/26/17 09:23	10/02/17 19:10	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/26/17 09:23	10/02/17 19:10	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/26/17 09:23	10/02/17 19:10	7439-92-1	
Magnesium, Dissolved	15200	ug/L	500	2.6	1	09/26/17 09:23	10/02/17 19:10	7439-95-4	
Manganese, Dissolved	0.75J	ug/L	5.0	0.38	1	09/26/17 09:23	10/02/17 19:10	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/26/17 09:23	10/02/17 19:10	7440-02-0	
Potassium, Dissolved	1580J	ug/L	2500	126	1	09/26/17 09:23	10/02/17 19:10	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/26/17 09:23	10/02/17 19:10	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/26/17 09:23	10/02/17 19:10	7440-22-4	
Sodium, Dissolved	15100	ug/L	1000	44.6	1	09/26/17 09:23	10/02/17 19:10	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/26/17 09:23	10/02/17 19:10	7440-28-0	
Vanadium, Dissolved	6.1J	ug/L	15.0	0.42	1	09/26/17 09:23	10/02/17 19:10	7440-62-2	
Zinc, Dissolved	36.4	ug/L	20.0	1.8	1	09/26/17 09:23	10/02/17 19:10	7440-66-6	B
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/26/17 08:24	09/26/17 14:45	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	197	mg/L	5.0	1.4	1		10/02/17 14:25		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	271	mg/L	10.0	5.0	1		09/25/17 15:30		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/25/17 16:48	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.4	mg/L	1.2	0.14	1		09/21/17 15:37	16887-00-6	
Nitrate as N	2.5	mg/L	0.10	0.0079	1		09/21/17 15:37	14797-55-8	
Sulfate	9.6	mg/L	1.2	0.27	1		09/21/17 15:37	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Sample: FD01-GW-091917**      **Lab ID: 10404160003**      Collected: 09/19/17 15:00      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.9</b>	mg/L	0.020	0.0075	1		09/28/17 15:39		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	09/25/17 10:37	09/25/17 13:49		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.49J</b>	mg/L	1.0	0.20	1		09/25/17 23:20	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

**Sample: FD02-GW-091917**      **Lab ID: 10404160004**      Collected: 09/19/17 15:30      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		09/24/17 12:10	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		09/24/17 12:10	74-85-1	
Methane	1.6J	ug/L	10.0	1.1	1		09/24/17 12:10	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	09/26/17 09:23	10/02/17 19:13	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	09/26/17 09:23	10/02/17 19:13	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	09/26/17 09:23	10/02/17 19:13	7440-38-2	
Barium, Dissolved	29.3	ug/L	10.0	0.22	1	09/26/17 09:23	10/02/17 19:13	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	09/26/17 09:23	10/02/17 19:13	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	09/26/17 09:23	10/02/17 19:13	7440-43-9	
Calcium, Dissolved	47500	ug/L	500	24.7	1	09/26/17 09:23	10/02/17 19:13	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	09/26/17 09:23	10/02/17 19:13	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	09/26/17 09:23	10/02/17 19:13	7440-48-4	
Copper, Dissolved	26.8	ug/L	10.0	0.83	1	09/26/17 09:23	10/02/17 19:13	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	09/26/17 09:23	10/02/17 19:13	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	09/26/17 09:23	10/02/17 19:13	7439-92-1	
Magnesium, Dissolved	14300	ug/L	500	2.6	1	09/26/17 09:23	10/02/17 19:13	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	09/26/17 09:23	10/02/17 19:13	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	09/26/17 09:23	10/02/17 19:13	7440-02-0	
Potassium, Dissolved	1440J	ug/L	2500	126	1	09/26/17 09:23	10/02/17 19:13	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	09/26/17 09:23	10/02/17 19:13	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	09/26/17 09:23	10/02/17 19:13	7440-22-4	
Sodium, Dissolved	13200	ug/L	1000	44.6	1	09/26/17 09:23	10/02/17 19:13	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	09/26/17 09:23	10/02/17 19:13	7440-28-0	
Vanadium, Dissolved	8.7J	ug/L	15.0	0.42	1	09/26/17 09:23	10/02/17 19:13	7440-62-2	
Zinc, Dissolved	48.5	ug/L	20.0	1.8	1	09/26/17 09:23	10/02/17 19:13	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	09/26/17 08:24	09/26/17 14:48	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	165	mg/L	5.0	1.4	1		10/03/17 09:43		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	292	mg/L	10.0	5.0	1		09/25/17 15:30		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		09/25/17 16:49	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	14.7	mg/L	1.2	0.14	1		09/21/17 15:22	16887-00-6	
Nitrate as N	4.2	mg/L	0.10	0.0079	1		09/21/17 15:22	14797-55-8	
Sulfate	13.2	mg/L	1.2	0.27	1		09/21/17 15:22	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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**Sample: FD02-GW-091917**      **Lab ID: 10404160004**      Collected: 09/19/17 15:30      Received: 09/21/17 12:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>3.2</b>	mg/L	0.10	0.037	5		09/28/17 15:49		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	09/25/17 10:37	09/25/17 13:49		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.67J</b>	mg/L	1.0	0.20	1		09/25/17 23:33	7440-44-0	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 498171

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10404160002, 10404160003

METHOD BLANK: 2708450

Matrix: Water

Associated Lab Samples: 10404160002, 10404160003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	09/24/17 08:24	
Ethene	ug/L	<0.68	10.0	0.68	09/24/17 08:24	
Methane	ug/L	1.5J	10.0	1.1	09/24/17 08:24	

LABORATORY CONTROL SAMPLE & LCSD: 2708451

2708452

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	% Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	106	98.3	94	86	85-115	8	20	
Ethene	ug/L	106	100	93.4	95	88	85-115	7	20	
Methane	ug/L	60.7	56.0	55.0	92	91	85-115	2	20	

SAMPLE DUPLICATE: 2708453

Parameter	Units	10404078001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	1.6J		20	
Methane	ug/L	ND	7.0J		20	

SAMPLE DUPLICATE: 2708454

Parameter	Units	10404083005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	1.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Project No.: 10404160

QC Batch: 498548 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10404160004

METHOD BLANK: 2710787 Matrix: Water  
Associated Lab Samples: 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	09/24/17 11:42	
Ethene	ug/L	<0.68	10.0	0.68	09/24/17 11:42	
Methane	ug/L	1.5J	10.0	1.1	09/24/17 11:42	

LABORATORY CONTROL SAMPLE & LCSD: 2710788

Parameter	Units	2710789								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	98.3	108	86	95	85-115	9	20	
Ethene	ug/L	106	93.4	102	88	96	85-115	8	20	
Methane	ug/L	60.7	55.0	57.0	91	94	85-115	4	20	

SAMPLE DUPLICATE: 2710790

Parameter	Units	10404160004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	1.6J	1.7J		20	

SAMPLE DUPLICATE: 2710791

Parameter	Units	60253549006 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	51.4	53.5	4	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

QC Batch: 498550 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10404160001

METHOD BLANK: 2710799 Matrix: Water  
Associated Lab Samples: 10404160001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	09/25/17 10:58	
Ethene	ug/L	<0.68	10.0	0.68	09/25/17 10:58	
Methane	ug/L	1.6J	10.0	1.1	09/25/17 10:58	

LABORATORY CONTROL SAMPLE & LCSD: 2710800

Parameter	Units	2710801								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	97.7	110	86	97	85-115	12	20	
Ethene	ug/L	106	93.3	103	88	97	85-115	10	20	
Methane	ug/L	60.7	56.1	57.8	93	95	85-115	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710802

Parameter	Units	2710803										
		10404160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	78.5	90.4	69	80	30-150	14	20	
Ethene	ug/L	<0.68	106	106	73.0	84.8	69	80	30-150	15	20	
Methane	ug/L	1.4J	60.7	60.7	41.5	47.1	66	75	30-150	13	20	

SAMPLE DUPLICATE: 2710804

Parameter	Units	1297085008 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	2.0J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 498323

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 2709172

Matrix: Water

Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	09/26/17 14:04	

LABORATORY CONTROL SAMPLE: 2709173

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.1	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2709174 2709175

Parameter	Units	2709174		2709175		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10404160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury, Dissolved	ug/L	<0.062	5	5	5.3	5.2	105	104	80-120	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 498753

Analysis Method: 6010C Met

QC Batch Method: EPA 3010

Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 2712101

Matrix: Water

Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	10/02/17 18:48	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	10/02/17 18:48	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	10/02/17 18:48	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	10/02/17 18:48	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	10/02/17 18:48	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	10/02/17 18:48	
Calcium, Dissolved	ug/L	<24.7	500	24.7	10/02/17 18:48	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	10/02/17 18:48	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	10/02/17 18:48	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	10/02/17 18:48	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	10/02/17 18:48	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	10/02/17 18:48	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	10/02/17 18:48	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	10/02/17 18:48	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	10/02/17 18:48	
Potassium, Dissolved	ug/L	<126	2500	126	10/02/17 18:48	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	10/02/17 18:48	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	10/02/17 18:48	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	10/02/17 18:48	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	10/02/17 18:48	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	10/02/17 18:48	
Zinc, Dissolved	ug/L	4.5J	20.0	1.8	10/02/17 18:48	

LABORATORY CONTROL SAMPLE: 2712102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	21900	109	80-120	
Antimony, Dissolved	ug/L	1000	1080	108	80-120	
Arsenic, Dissolved	ug/L	1000	1050	105	80-120	
Barium, Dissolved	ug/L	1000	1050	105	80-120	
Beryllium, Dissolved	ug/L	1000	1050	105	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	19700	98	80-120	
Chromium, Dissolved	ug/L	1000	1020	102	80-120	
Cobalt, Dissolved	ug/L	1000	1030	103	80-120	
Copper, Dissolved	ug/L	1000	1040	104	80-120	
Iron, Dissolved	ug/L	20000	20400	102	80-120	
Lead, Dissolved	ug/L	1000	1040	104	80-120	
Magnesium, Dissolved	ug/L	20000	20600	103	80-120	
Manganese, Dissolved	ug/L	1000	1040	104	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

LABORATORY CONTROL SAMPLE: 2712102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1030	103	80-120	
Potassium, Dissolved	ug/L	20000	21000	105	80-120	
Selenium, Dissolved	ug/L	1000	1110	111	80-120	
Silver, Dissolved	ug/L	500	506	101	80-120	
Sodium, Dissolved	ug/L	20000	21200	106	80-120	
Thallium, Dissolved	ug/L	1000	1050	105	80-120	
Vanadium, Dissolved	ug/L	1000	998	100	80-120	
Zinc, Dissolved	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2712103 2712104

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10404160001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	<8.6	20000	20000	21600	21900	108	109	75-125	1	20
Antimony, Dissolved	ug/L	<3.1	1000	1000	1070	1100	107	110	75-125	2	20
Arsenic, Dissolved	ug/L	<5.2	1000	1000	1040	1050	104	105	75-125	1	20
Barium, Dissolved	ug/L	29.0	1000	1000	1060	1070	103	104	75-125	1	20
Beryllium, Dissolved	ug/L	<0.11	1000	1000	1040	1050	104	105	75-125	1	20
Cadmium, Dissolved	ug/L	<0.46	1000	1000	1010	1020	101	102	75-125	1	20
Calcium, Dissolved	ug/L	46900	20000	20000	67700	68400	104	107	75-125	1	20
Chromium, Dissolved	ug/L	<0.50	1000	1000	998	1010	100	101	75-125	1	20
Cobalt, Dissolved	ug/L	<1.1	1000	1000	989	1000	99	100	75-125	1	20
Copper, Dissolved	ug/L	22.7	1000	1000	1050	1060	103	104	75-125	1	20
Iron, Dissolved	ug/L	<16.7	20000	20000	20000	20300	100	101	75-125	1	20
Lead, Dissolved	ug/L	<3.0	1000	1000	1010	1020	101	102	75-125	1	20
Magnesium, Dissolved	ug/L	14200	20000	20000	34700	35000	103	104	75-125	1	20
Manganese, Dissolved	ug/L	<0.38	1000	1000	1020	1030	102	103	75-125	1	20
Nickel, Dissolved	ug/L	<1.1	1000	1000	991	1000	99	100	75-125	1	20
Potassium, Dissolved	ug/L	1430J	20000	20000	22600	22800	106	107	75-125	1	20
Selenium, Dissolved	ug/L	<6.4	1000	1000	1080	1090	108	109	75-125	1	20
Silver, Dissolved	ug/L	<0.27	500	500	500	505	100	101	75-125	1	20
Sodium, Dissolved	ug/L	13000	20000	20000	34000	34400	105	107	75-125	1	20
Thallium, Dissolved	ug/L	<4.8	1000	1000	1010	1020	101	102	75-125	2	20
Vanadium, Dissolved	ug/L	8.8J	1000	1000	995	1010	99	100	75-125	1	20
Zinc, Dissolved	ug/L	43.2	1000	1000	1030	1040	98	99	75-125	1	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

QC Batch: 499956 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10404160001, 10404160002, 10404160003

METHOD BLANK: 2718290 Matrix: Water  
Associated Lab Samples: 10404160001, 10404160002, 10404160003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	10/02/17 10:38	

LABORATORY CONTROL SAMPLE & LCSD: 2718291 2718292

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	43.2	43.2	108	108	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2718293 2718294

Parameter	Units	10403967001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	95.2	40	40	138	138	107	108	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2718295 2718296

Parameter	Units	10404160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	169	40	40	209	213	100	110	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

QC Batch: 500190 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10404160004

METHOD BLANK: 2719373 Matrix: Water  
Associated Lab Samples: 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	10/03/17 09:29	

LABORATORY CONTROL SAMPLE & LCSD: 2719374 2719375

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	43.1	42.5	108	106	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2719376 2719377

Parameter	Units	10404228011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	128	40	40	177	171	123	107	80-120	4	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2719378 2719379

Parameter	Units	10404173002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	316	40	40	363	354	119	97	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 498585

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10404160001, 10404160002

METHOD BLANK: 2710869

Matrix: Water

Associated Lab Samples: 10404160001, 10404160002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	09/25/17 13:53	

LABORATORY CONTROL SAMPLE: 2710870

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	960	96	80-120	

SAMPLE DUPLICATE: 2710871

Parameter	Units	10403967001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	606	596	2	10	

SAMPLE DUPLICATE: 2710872

Parameter	Units	10404160001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	275	277	1	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 498714

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10404160003, 10404160004

METHOD BLANK: 2711617

Matrix: Water

Associated Lab Samples: 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	09/25/17 15:30	

LABORATORY CONTROL SAMPLE: 2711618

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	990	99	80-120	

SAMPLE DUPLICATE: 2711619

Parameter	Units	10404331005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1080	1100	2	10	

SAMPLE DUPLICATE: 2711620

Parameter	Units	10404331006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1090	1040	4	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 90059

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 386156

Matrix: Water

Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	09/25/17 16:44	

LABORATORY CONTROL SAMPLE: 386157

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	108	90-110	

MATRIX SPIKE SAMPLE: 386159

Parameter	Units	10404160001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.18	88	75-125	

SAMPLE DUPLICATE: 386158

Parameter	Units	10404160001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

QC Batch: 498185 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 2708491 Matrix: Water  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	09/22/17 11:00	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	09/22/17 11:00	
Sulfate	mg/L	<0.27	1.2	0.27	09/22/17 11:00	

LABORATORY CONTROL SAMPLE: 2708492

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.4	99	90-110	
Nitrate as N	mg/L	1	0.96	96	90-110	
Sulfate	mg/L	12.5	12.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708493 2708494

Parameter	Units	10404160001		MSD		MSD		% Rec		Max		
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	14.7	12.5	12.5	24.9	24.8	82	81	90-110	0	20	M1
Nitrate as N	mg/L	4.2	1	1	4.6	4.6	45	43	90-110	0	20	M1
Sulfate	mg/L	13.2	12.5	12.5	23.6	23.5	83	82	90-110	0	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2708495 2708496

Parameter	Units	10404160002		MSD		MSD		% Rec		Max		
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	5.4	12.5	12.5	16.7	17.3	91	95	90-110	3	20	
Nitrate as N	mg/L	2.5	1	1	3.2	3.3	67	77	90-110	3	20	M1
Sulfate	mg/L	9.2	12.5	12.5	20.0	20.6	87	91	90-110	3	20	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

QC Batch: 499428 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 2715174 Matrix: Water  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	09/28/17 15:09	

LABORATORY CONTROL SAMPLE: 2715175

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2715176 2715177

Parameter	Units	10404353006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.9	1	1	2.8	2.9	84	103	90-110	7	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2715178 2715179

Parameter	Units	10404160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	3.2	5	5	8.2	8.2	101	100	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

QC Batch: 498614 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 2710967 Matrix: Water  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	09/25/17 13:44	

LABORATORY CONTROL SAMPLE: 2710968

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	296	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710969 2710970

Parameter	Units	10404074001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chemical Oxygen Demand	mg/L	301	250	250	549	531	99	92	90-110	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710971 2710972

Parameter	Units	10404160001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Chemical Oxygen Demand	mg/L	<15.8	250	250	246	257	98	103	90-110	4	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10404160

QC Batch: 126554 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

METHOD BLANK: 502884 Matrix: Water  
Associated Lab Samples: 10404160001, 10404160002, 10404160003, 10404160004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	09/25/17 18:06	

LABORATORY CONTROL SAMPLE: 502885

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	26.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 502886 502887

Parameter	Units	10403885017	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Total Organic Carbon	mg/L	5.4	25	25	32.2	32.3	107	108	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 502888 502889

Parameter	Units	10404160001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Total Organic Carbon	mg/L	0.66J	25	25	27.5	27.5	107	107	80-120	0	20	

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10404160

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10404160001	Marlow-GW-091917	RSK 175	498550		
10404160002	Randall-GW-091917	RSK 175	498171		
10404160003	FD01-GW-091917	RSK 175	498171		
10404160004	FD02-GW-091917	RSK 175	498548		
10404160001	Marlow-GW-091917	EPA 3010	498753	6010C Met	498879
10404160002	Randall-GW-091917	EPA 3010	498753	6010C Met	498879
10404160003	FD01-GW-091917	EPA 3010	498753	6010C Met	498879
10404160004	FD02-GW-091917	EPA 3010	498753	6010C Met	498879
10404160001	Marlow-GW-091917	EPA 7470A	498323	EPA 7470A	498876
10404160002	Randall-GW-091917	EPA 7470A	498323	EPA 7470A	498876
10404160003	FD01-GW-091917	EPA 7470A	498323	EPA 7470A	498876
10404160004	FD02-GW-091917	EPA 7470A	498323	EPA 7470A	498876
10404160001	Marlow-GW-091917	SM 2320B	499956		
10404160002	Randall-GW-091917	SM 2320B	499956		
10404160003	FD01-GW-091917	SM 2320B	499956		
10404160004	FD02-GW-091917	SM 2320B	500190		
10404160001	Marlow-GW-091917	SM 2540C	498585		
10404160002	Randall-GW-091917	SM 2540C	498585		
10404160003	FD01-GW-091917	SM 2540C	498714		
10404160004	FD02-GW-091917	SM 2540C	498714		
10404160001	Marlow-GW-091917	SM 4500-S-2 D	90059		
10404160002	Randall-GW-091917	SM 4500-S-2 D	90059		
10404160003	FD01-GW-091917	SM 4500-S-2 D	90059		
10404160004	FD02-GW-091917	SM 4500-S-2 D	90059		
10404160001	Marlow-GW-091917	EPA 300.0	498185		
10404160002	Randall-GW-091917	EPA 300.0	498185		
10404160003	FD01-GW-091917	EPA 300.0	498185		
10404160004	FD02-GW-091917	EPA 300.0	498185		
10404160001	Marlow-GW-091917	EPA 353.2	499428		
10404160002	Randall-GW-091917	EPA 353.2	499428		
10404160003	FD01-GW-091917	EPA 353.2	499428		
10404160004	FD02-GW-091917	EPA 353.2	499428		
10404160001	Marlow-GW-091917	EPA 410.4	498614	EPA 410.4	498704
10404160002	Randall-GW-091917	EPA 410.4	498614	EPA 410.4	498704
10404160003	FD01-GW-091917	EPA 410.4	498614	EPA 410.4	498704
10404160004	FD02-GW-091917	EPA 410.4	498614	EPA 410.4	498704
10404160001	Marlow-GW-091917	SM 5310C	126554		
10404160002	Randall-GW-091917	SM 5310C	126554		
10404160003	FD01-GW-091917	SM 5310C	126554		
10404160004	FD02-GW-091917	SM 5310C	126554		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10404160

### Section A

Required Client Information:

### Section B

Required Project Information:

### Section C

Invoice Information:

Page: ( Of /

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Walsh
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com	Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221
Email:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Phone:	Project Name: Freeman WA-Grain Handling Facility	Pace Project Manager: Jennifer Gross
Requested Due Date: 10 Day Standard	Project #: 1497	Pace Profile #: 36447 / 4


Regulatory Agency
State / Location WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES						ANALYSES TEST Y/N	REQUESTED ANALYSIS FILTERED (Y/N)												MS/MSD Requested			
				DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8260	60107470 TAL Dissolved Metals *	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate-Nitrite 353.2						
1	Marlow-GW-091917	WTG		9/19/17	1310	9/20/17	1522	24	XXX	X																					MS/MSD	
2	Randall-GW-091917				1026			8																								
3	FD01-GW-091917				1500			8																								Field Dup
4	FD02-GW-091917				1530			8																							Field Dup	
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																

001  
002  
003  
004

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	JLB/CH2M	9-20-17	1522	[Signature] PACE	9/21/17	1245	Y Y Y
*Field filtered by client							

Page 43 of 49	SAMPLER NAME AND SIGNATURE				TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER: L K Baumann								
	SIGNATURE of SAMPLER: [Signature]			DATE Signed: 9-20-17					

	Document Name: <b>Sample Condition Upon Receipt Form - ESI</b>	Document Revised: 30Aug2017 Page 1 of 2
	Document No.: <b>F-MN-L-210-rev.23</b>	Issuing Authority: Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: WPRR

Project #: **WO#: 10404160**



10404160

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 7448 1032 6606

Custody Seal on Cooler/Box Present?  Yes  No    Seals Intact?  Yes  No    Optional:    Proj. Due Date:    Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_    Temp Blank?  Yes  No

Thermometer  151401163    Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Used:  87A9155100842

Cooler Temp Read (°C): 2.8, 4.2    Cooler Temp Corrected (°C): 2.3, 3.7    Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C    Correction Factor: -0.5    Date and Initials of Person Examining Contents: ET 9/21/17

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. <del>SAMPLE #1 MISSING HEADSPACE SAMPLES</del> <del>(9/4) SAMPLE #4 MISSING HEADSPACE SAMPLES</del> <del>(3/3) VSL</del> JMG 9/22/17
-Includes Date/Time/ID/Analysis Matrix: <u>WPR</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, <del>COC/DOC</del> , Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample #    3/3    3/3    3/3 1-    "    "    " 2-4:    "    "    "
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed:    Lot # of added preservative:
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>13:00</u>	Temp: <u>2.8, 4.2</u>	Corrected Temp: <u>2.3, 3.7</u>
Time: <u>13:15</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: 09/22/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

WO#: 2061931



nalytical<sup>®</sup>  
www.pacelabs.com

Workorder: 10404160

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 9/21/2017

Results Requested By: 10/5/2017

Report To		Subcontract To					Requested Analysis																										
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					<div style="display: flex; justify-content: space-between;"> <span>5636267 / 4500 Sulfide</span> <span>LAB USE ONLY</span> </div>																										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other																											
1	Marlow-GW-091917	RQS	9/19/2017 13:10	10404160001	Water	3																											
2	Randall-GW-091917	PS	9/19/2017 10:26	10404160002	Water	1																											
3	FD01-GW-091917	PS	9/19/2017 15:00	10404160003	Water	1																											
4	FD02-GW-091917	PS	9/19/2017 15:30	10404160004	Water	1																											
5																																	
Transfers		Released By	Date/Time	Received By		Date/Time		Comments																									
1		<i>Chris O'Connell</i> Pace MN	9/22/17 1330	<i>John Pace</i>		9-22-17 836																											
2		<i>FedEx</i>	9-23-17 836	<i>John Pace</i>		9-22-17 830																											
3																																	
Cooler Temperature on Receipt			4.0 °C	Custody Seal		(Y) or N	Received on Ice		(Y) or N	Samples Intact												(Y) or N											

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

Project

# WO#: 2061931

PM: CMM

Due Date: 10/05/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 09-23-17

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Chain of Custody



Workorder: 10404112

Workorder Name: UPRR LATC Upper Lot

Owner Received Date: 9/21/2017 Results Requested By: 9/26/2017

Report To		Subcontract To				Requested Analysis														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Davis 2795 Second Street Suite 300 Davis, CA 95618 Phone (530)297-4800				<div style="float: right; font-size: 2em; font-weight: bold;">1297279</div>														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				5632528 / 8260B MSV 5035 Low	LAB USE ONLY									
						MeCh	Unpreserved													
1	AB_36_9_14_17B	PS	9/14/2017 17:00	10404112001	Solid	1	1			X										
2	HSP_5_9_16_17A	PS	9/16/2017 11:20	10404112005	Solid	1	1			X										
3																				
4																				
5																				
Transfers		Released By	Date/Time	Received By	Date/Time	Comments														
1		<i>Anna Asp</i>	Pace MN 9/25/17 1345	<i>[Signature]</i>	9/26/17															
2																				
3																				
Cooler Temperature on Receipt		3.6 °C	Custody Seal	<input checked="" type="checkbox"/> Y or N	Received on Ice	<input checked="" type="checkbox"/> Y or N	Samples Intact					<input checked="" type="checkbox"/> Y or N								

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



**Sample Condition Upon Receipt**

Client Name: UPRR (Pace - Minneapolis) Project #:

**WO# : 1297279**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  OnTrac  Other: \_\_\_\_\_  
 Tracking Number: 7475 9828 1992

Custody Seal on Cooler/Box Present?  Yes  No <sup>by [signature]</sup> Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermom. Used:  DA1434  DA2285 Type of Ice:  Wet  Blue  Dry Ice  None  Samples on ice, cooling process has begun

Cooler Temp Read(°C): 2.8 Cooler Temp Corrected(°C): 3.6 Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: +0.8 Date and Initials of Person Examining Contents: [signature] 092617

**Comments:**

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Project Manager Review: [signature]

Date: 9/26/2017

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Client: UPRR (Pace Minneapolis) **SOIL CHECKLIST** Work Order: 1297279 Initials/Date: ej 092617

Are samples soil or other regulated material? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If no, matrix description:
Sample Origin (circle one):		FOREIGN (including non-continental U.S.)
		<b>DOMESTIC</b>
If Foreign, list Country of Origin:		(regulated, proceed to Requirements)
If Domestic, circle State of Origin:	CA ID NM NY OR – Indicate County of Origin <u>LA County</u>	
	Site address must be confirmed against quarantine areas in these states. If unknown, contact PM. Project cannot be received until this is determined.	
	Are samples from a quarantine zone? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If No, proceed with receipt, samples are not regulated, if yes, proceed to depth question.)	
	AL AR FL GA LA MS NC OK SC TN TX VA (Regulated, proceed to depth question)	
	<input type="checkbox"/> NONE OF THE ABOVE (Proceed to receipt, samples are not regulated.)	
Are any samples from a depth of ≤ 6 ft?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not indicated
Is sub analysis requested?		<input type="checkbox"/> Yes <input type="checkbox"/> No (If No to both questions, proceed to receipt, samples are not regulated.)

REQUIREMENT	ACTION	COMPLETED
Domestic soils from a depth of >6 feet are exempt from classification as regulated soil per California APHIS /USDA guidelines.	Were samples segregated by depth ≤ or > 6 feet?	YES NO N/A
	<b>If samples are to be subcontracted outside of California, treat sub samples as regulated soil.</b>	
Samples must be double contained to prevent accidental release. Anything that comes into contact with loose soil must be treated as regulated.	Were there any signs of breakage or leakage (check for broken glass and/or loose soil in the cooler)?	YES NO
	If YES, were ice and melt water sterilized by adding enough bleach to achieve a 10% concentration and sitting for ≥ 30 minutes before disposing.	YES NO N/A
	If YES, was any broken glass and/or loose soil placed in the USDA Regulated soil drum or Regulated satellite container?	YES NO N/A
Samples must be segregated and stored in designated bins and coolers.	Were samples placed in a designated container and cooler?	YES NO
Yellow stickers identify regulated soil samples.	Did yellow stickers get placed on all sample containers?	YES NO
Equipment and supplies that have come into contact with samples must be decontaminated or disposed of properly.	Were the cooler(s) and/or countertop(s) decontaminated using a fresh 10% bleach solution? Were gloves, disposable lab supplies or shipping materials disposed of in the SR USDA Regulated satellite container?	YES NO

**To Be Completed by PM/PC for Regulated Soils:**

Sample Analysis to be conducted at (circle all that apply): Davis Subcontract Lab  
Name of Subcontract Lab(s): \_\_\_\_\_

REQUIREMENT	ACTION	COMPLETED
USDA / APHIS rep must be informed by email when regulated soils are received and prior to shipping to any subcontract lab, including IR Pace Labs.	Notification to Anthony Jackson, USDA APHIS PPQ indicated on California Regulated Soil Notification form.	YES NO
Sub shipments must include a valid copy of the receiving lab's permit along with all required forms.	Is a copy of all needed paperwork included with the COC? (SR cannot ship samples until all necessary paperwork is compiled.)	YES NO N/A

Comments: \_\_\_\_\_

Project Manager Signature: \_\_\_\_\_ Date: \_\_\_\_\_

September 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

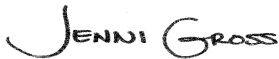
RE: Project: Freeman, WA-Cenex Harvest Leas  
Pace Project No.: 10404191

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman, WA-Cenex Harvest Leas  
Pace Project No.: 10404191

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10404191001	FD01-GW-091917	Water	09/19/17 15:00	09/21/17 12:45
10404191002	FD02-GW-091917	Water	09/19/17 15:30	09/21/17 12:45
10404191003	TB-091917	Water	09/19/17 07:00	09/21/17 12:45

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### SAMPLE ANALYTE COUNT

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10404191001	FD01-GW-091917	EPA 8260B	DJB	83	PASI-M
10404191002	FD02-GW-091917	EPA 8260B	DJB	83	PASI-M
10404191003	TB-091917	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10404191001</b>	<b>FD01-GW-091917</b>					
EPA 8260B	Acetone	24.3	ug/L	20.0	09/26/17 17:51	
EPA 8260B	Carbon disulfide	0.54J	ug/L	1.0	09/26/17 17:51	
EPA 8260B	Carbon tetrachloride	256	ug/L	2.5	09/27/17 20:26	
EPA 8260B	Chloroform	10.5	ug/L	1.0	09/26/17 17:51	
<b>10404191002</b>	<b>FD02-GW-091917</b>					
EPA 8260B	Carbon tetrachloride	142	ug/L	0.50	09/26/17 17:28	
EPA 8260B	Chloroform	8.7	ug/L	1.0	09/26/17 17:28	

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## PROJECT NARRATIVE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 28, 2017

**General Information:**

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 498839

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

Sample: **FD01-GW-091917** Lab ID: **10404191001** Collected: 09/19/17 15:00 Received: 09/21/17 12:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 17:51	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 17:51	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 17:51	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 17:51	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:51	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:51	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 17:51	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:51	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 17:51	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 17:51	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 17:51	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 17:51	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 17:51	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 17:51	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 17:51	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:51	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:51	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 17:51	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 17:51	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 17:51	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 17:51	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 17:51	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 17:51	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 17:51	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 17:51	108-10-1	
Acetone	24.3	ug/L	20.0	8.8	1		09/26/17 17:51	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 17:51	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 17:51	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:51	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 17:51	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 17:51	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 17:51	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 17:51	74-83-9	
Carbon disulfide	0.54J	ug/L	1.0	0.37	1		09/26/17 17:51	75-15-0	
Carbon tetrachloride	256	ug/L	2.5	1.0	5		09/27/17 20:26	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 17:51	75-00-3	
Chloroform	10.5	ug/L	1.0	0.46	1		09/26/17 17:51	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 17:51	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Sample Project No.: 10404191

**Sample: FD01-GW-091917**      **Lab ID: 10404191001**      Collected: 09/19/17 15:00      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 17:51	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 17:51	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 17:51	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 17:51	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 17:51	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 17:51	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 17:51	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:51	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 17:51	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/26/17 17:51	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 17:51	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 17:51	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 17:51	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 17:51	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 17:51	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:51	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 17:51	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:51	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:51	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 17:51	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:51	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 17:51	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/26/17 17:51	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 17:51	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 17:51	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:51	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 17:51	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		09/26/17 17:51	17060-07-0	
Toluene-d8 (S)	106	%	75-125		1		09/26/17 17:51	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		09/26/17 17:51	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Project No.: 10404191

Sample: **FD02-GW-091917** Lab ID: **10404191002** Collected: 09/19/17 15:30 Received: 09/21/17 12:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 17:28	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 17:28	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 17:28	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 17:28	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:28	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:28	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 17:28	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:28	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 17:28	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 17:28	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 17:28	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 17:28	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 17:28	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 17:28	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 17:28	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 17:28	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:28	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 17:28	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 17:28	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 17:28	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 17:28	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 17:28	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 17:28	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 17:28	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 17:28	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		09/26/17 17:28	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 17:28	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 17:28	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:28	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 17:28	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 17:28	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 17:28	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 17:28	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/26/17 17:28	75-15-0	
Carbon tetrachloride	142	ug/L	0.50	0.20	1		09/26/17 17:28	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 17:28	75-00-3	
Chloroform	8.7	ug/L	1.0	0.46	1		09/26/17 17:28	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 17:28	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Project No.: 10404191

Sample: **FD02-GW-091917** Lab ID: **10404191002** Collected: 09/19/17 15:30 Received: 09/21/17 12:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 17:28	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 17:28	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 17:28	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 17:28	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 17:28	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 17:28	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 17:28	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 17:28	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 17:28	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/26/17 17:28	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 17:28	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 17:28	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 17:28	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 17:28	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 17:28	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:28	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 17:28	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 17:28	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:28	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 17:28	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 17:28	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 17:28	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/26/17 17:28	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 17:28	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 17:28	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 17:28	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 17:28	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		09/26/17 17:28	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		09/26/17 17:28	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		09/26/17 17:28	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

**Sample: TB-091917**      **Lab ID: 10404191003**      Collected: 09/19/17 07:00      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 15:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/26/17 15:31	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/26/17 15:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/26/17 15:31	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:31	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:31	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/26/17 15:31	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:31	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/26/17 15:31	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/26/17 15:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/26/17 15:31	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/26/17 15:31	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/26/17 15:31	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/26/17 15:31	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/26/17 15:31	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/26/17 15:31	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 15:31	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/26/17 15:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/26/17 15:31	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/26/17 15:31	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/26/17 15:31	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/26/17 15:31	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/26/17 15:31	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/26/17 15:31	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/26/17 15:31	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		09/26/17 15:31	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/26/17 15:31	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/26/17 15:31	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/26/17 15:31	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 15:31	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/26/17 15:31	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/26/17 15:31	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/26/17 15:31	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/26/17 15:31	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/26/17 15:31	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/26/17 15:31	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/26/17 15:31	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/26/17 15:31	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Sample Project No.: 10404191

**Sample: TB-091917**      **Lab ID: 10404191003**      Collected: 09/19/17 07:00      Received: 09/21/17 12:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/26/17 15:31	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/26/17 15:31	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/26/17 15:31	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/26/17 15:31	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/26/17 15:31	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/26/17 15:31	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/26/17 15:31	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/26/17 15:31	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/26/17 15:31	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/26/17 15:31	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/26/17 15:31	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/26/17 15:31	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/26/17 15:31	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/26/17 15:31	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/26/17 15:31	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/26/17 15:31	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/26/17 15:31	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/26/17 15:31	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 15:31	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/26/17 15:31	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/26/17 15:31	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/26/17 15:31	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/26/17 15:31	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/26/17 15:31	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/26/17 15:31	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/26/17 15:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/26/17 15:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		09/26/17 15:31	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1		09/26/17 15:31	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		09/26/17 15:31	460-00-4	

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

QC Batch: 498839 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10404191001, 10404191002, 10404191003

METHOD BLANK: 2712331 Matrix: Water

Associated Lab Samples: 10404191001, 10404191002, 10404191003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/26/17 12:00	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/26/17 12:00	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/26/17 12:00	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/26/17 12:00	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/26/17 12:00	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/26/17 12:00	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/26/17 12:00	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/26/17 12:00	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/26/17 12:00	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/26/17 12:00	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/26/17 12:00	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/26/17 12:00	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/26/17 12:00	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/26/17 12:00	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/26/17 12:00	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/26/17 12:00	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/26/17 12:00	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/26/17 12:00	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/26/17 12:00	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/26/17 12:00	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/26/17 12:00	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/26/17 12:00	
Acetone	ug/L	<8.8	20.0	8.8	09/26/17 12:00	
Acrolein	ug/L	<4.8	10.0	4.8	09/26/17 12:00	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/26/17 12:00	
Benzene	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/26/17 12:00	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/26/17 12:00	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/26/17 12:00	
Bromoform	ug/L	<1.0	4.0	1.0	09/26/17 12:00	
Bromomethane	ug/L	<1.5	4.0	1.5	09/26/17 12:00	
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/26/17 12:00	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/26/17 12:00	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

METHOD BLANK: 2712331

Matrix: Water

Associated Lab Samples: 10404191001, 10404191002, 10404191003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
Chloroethane	ug/L	<0.44	1.0	0.44	09/26/17 12:00	
Chloroform	ug/L	<0.46	1.0	0.46	09/26/17 12:00	
Chloromethane	ug/L	<1.1	4.0	1.1	09/26/17 12:00	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/26/17 12:00	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Dibromomethane	ug/L	<0.50	1.0	0.50	09/26/17 12:00	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/26/17 12:00	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/26/17 12:00	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/26/17 12:00	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/26/17 12:00	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/26/17 12:00	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/26/17 12:00	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
Naphthalene	ug/L	<0.42	1.0	0.42	09/26/17 12:00	
o-Xylene	ug/L	<0.11	0.50	0.11	09/26/17 12:00	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
Styrene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/26/17 12:00	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/26/17 12:00	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/26/17 12:00	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/26/17 12:00	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/26/17 12:00	
Toluene	ug/L	<0.17	0.50	0.17	09/26/17 12:00	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/26/17 12:00	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	09/26/17 12:00	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/26/17 12:00	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/26/17 12:00	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/26/17 12:00	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/26/17 12:00	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/26/17 12:00	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/26/17 12:00	
1,2-Dichloroethane-d4 (S)	%	107	75-137		09/26/17 12:00	
4-Bromofluorobenzene (S)	%	101	75-125		09/26/17 12:00	
Toluene-d8 (S)	%	106	75-125		09/26/17 12:00	

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

LABORATORY CONTROL SAMPLE & LCSD: 2712332		2712333								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.4	19.8	102	99	75-136	3	30	
1,1,1-Trichloroethane	ug/L	20	20.2	19.3	101	97	75-129	5	30	
1,1,2,2-Tetrachloroethane	ug/L	20	20.8	20.7	104	103	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	20.9	20.4	105	102	75-125	3	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.0	19.1	100	96	69-126	4	30	
1,1-Dichloroethane	ug/L	20	20.0	19.7	100	99	75-125	2	30	
1,1-Dichloroethene	ug/L	20	20.3	19.2	101	96	75-125	6	30	
1,1-Dichloropropene	ug/L	20	20.0	19.0	100	95	75-125	5	30	
1,2,3-Trichlorobenzene	ug/L	20	20.8	21.7	104	108	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	20.3	20.5	102	102	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	19.8	19.8	99	99	75-125	0	30	
1,2,4-Trimethylbenzene	ug/L	20	21.1	20.7	105	104	75-125	2	30	
1,2-Dibromo-3-chloropropane	ug/L	50	49.4	50.8	99	102	71-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.9	20.4	104	102	75-125	2	30	
1,2-Dichlorobenzene	ug/L	20	20.3	20.2	102	101	75-125	0	30	
1,2-Dichloroethane	ug/L	20	18.5	18.1	93	91	70-125	2	30	
1,2-Dichloroethene (Total)	ug/L	40	39.5	37.8	99	95	75-125	4	30	
1,2-Dichloropropane	ug/L	20	19.3	18.8	97	94	75-125	2	30	
1,3,5-Trimethylbenzene	ug/L	20	21.7	21.2	109	106	75-125	2	30	
1,3-Dichlorobenzene	ug/L	20	21.0	20.4	105	102	75-125	3	30	
1,3-Dichloropropane	ug/L	20	20.6	20.6	103	103	75-125	0	30	
1,4-Dichlorobenzene	ug/L	20	20.6	20.0	103	100	75-125	3	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	410	394	103	99	64-140	4	30	
2,2,4-Trimethylpentane	ug/L	20	20.8	19.3	104	97	68-125	7	30	
2,2-Dichloropropane	ug/L	20	20.4	19.8	102	99	70-131	3	30	
2-Butanone (MEK)	ug/L	100	91.8	94.5	92	95	69-125	3	30	
2-Chlorotoluene	ug/L	20	21.7	21.2	109	106	75-125	3	30	
2-Hexanone	ug/L	100	108	106	108	106	73-129	2	30	
4-Chlorotoluene	ug/L	20	21.9	20.8	109	104	75-125	5	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	106	104	106	104	73-125	2	30	
Acetone	ug/L	100	97.1	92.1	97	92	66-126	5	30	
Acrolein	ug/L	200	161	165	80	83	56-150	3	30	
Acrylonitrile	ug/L	200	201	198	100	99	68-129	1	30	
Benzene	ug/L	20	19.2	18.6	96	93	75-125	3	30	
Bromobenzene	ug/L	20	21.2	20.7	106	104	75-125	3	30	
Bromochloromethane	ug/L	20	19.7	19.1	99	96	75-126	3	30	
Bromodichloromethane	ug/L	20	20.1	19.1	100	95	75-133	5	30	
Bromoform	ug/L	20	19.1	18.5	95	92	62-142	3	30	
Bromomethane	ug/L	20	14.4	16.3	72	82	34-143	13	30	
Carbon disulfide	ug/L	20	19.1	18.3	95	92	71-125	4	30	
Carbon tetrachloride	ug/L	20	20.1	19.4	101	97	71-145	4	30	
Chlorobenzene	ug/L	20	20.5	19.9	102	99	75-125	3	30	
Chloroethane	ug/L	20	20.6	19.9	103	100	75-125	4	30	
Chloroform	ug/L	20	19.0	18.4	95	92	75-125	4	30	
Chloromethane	ug/L	20	18.1	16.7	91	84	54-125	8	30	
cis-1,2-Dichloroethene	ug/L	20	19.9	18.9	99	95	75-125	5	30	
cis-1,3-Dichloropropene	ug/L	20	19.4	18.9	97	95	75-125	2	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

LABORATORY CONTROL SAMPLE & LCSD:		2712332		2712333							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.6	19.9	103	99	74-141	3	30		
Dibromomethane	ug/L	20	20.1	19.5	101	98	75-125	3	30		
Dichlorodifluoromethane	ug/L	20	18.7	18.1	93	90	59-130	4	30		
Dichlorofluoromethane	ug/L	20	19.5	18.9	98	95	75-125	3	30		
Diisopropyl ether	ug/L	20	19.0	18.9	95	95	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.4	19.4	97	97	73-125	0	30		
Ethylbenzene	ug/L	20	21.0	20.0	105	100	75-125	5	30		
Hexachloro-1,3-butadiene	ug/L	20	20.7	21.4	104	107	75-131	3	30		
Isopropylbenzene (Cumene)	ug/L	20	21.2	19.8	106	99	75-125	7	30		
m&p-Xylene	ug/L	40	42.8	41.0	107	102	75-125	4	30		
Methyl-tert-butyl ether	ug/L	20	19.0	19.1	95	96	75-125	0	30		
Methylene Chloride	ug/L	20	18.7	18.6	93	93	73-125	0	30		
n-Butylbenzene	ug/L	20	21.6	20.8	108	104	75-125	4	30		
n-Propylbenzene	ug/L	20	21.5	20.9	108	104	75-125	3	30		
Naphthalene	ug/L	20	18.3	19.5	92	97	74-125	6	30		
o-Xylene	ug/L	20	20.9	19.9	105	100	75-125	5	30		
p-Isopropyltoluene	ug/L	20	20.7	19.6	104	98	75-125	5	30		
sec-Butylbenzene	ug/L	20	21.4	20.7	107	103	75-125	3	30		
Styrene	ug/L	20	19.2	18.7	96	93	75-125	3	30		
tert-Amylmethyl ether	ug/L	20	19.3	19.2	96	96	71-126	1	30		
tert-Butyl Alcohol	ug/L	200	204	204	102	102	69-131	0	30		
tert-Butylbenzene	ug/L	20	21.2	20.6	106	103	75-125	3	30		
Tetrachloroethene	ug/L	20	20.6	19.7	103	99	75-125	4	30		
Tetrahydrofuran	ug/L	200	194	180	97	90	65-127	8	30		
Toluene	ug/L	20	20.1	19.1	100	96	75-125	5	30		
trans-1,2-Dichloroethene	ug/L	20	19.7	18.9	98	95	75-125	4	30		
trans-1,3-Dichloropropene	ug/L	20	19.3	18.8	97	94	75-125	3	30		
trans-1,4-Dichloro-2-butene	ug/L	50	47.9	49.6	96	99	30-150	4	30		
Trichloroethene	ug/L	20	19.8	19.1	99	95	75-125	4	30		
Trichlorofluoromethane	ug/L	20	20.5	20.0	102	100	71-140	3	30		
Vinyl acetate	ug/L	20	20.0	20.2	100	101	68-137	1	30		
Vinyl chloride	ug/L	20	20.1	19.2	100	96	70-125	4	30		
Xylene (Total)	ug/L	60	63.7	60.9	106	101	75-125	5	30		
1,2-Dichloroethane-d4 (S)	%				103	104	75-137				
4-Bromofluorobenzene (S)	%				98	101	75-125				
Toluene-d8 (S)	%				106	105	75-125				

MATRIX SPIKE SAMPLE:		2712364		10403566001							
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20.3	101	75-137					
1,1,1-Trichloroethane	ug/L	<0.15	20	21.4	107	75-139					
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20.6	103	60-142					
1,1,2-Trichloroethane	ug/L	<0.22	20	20.5	102	75-128					
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	22.9	114	62-150					

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

MATRIX SPIKE SAMPLE:	2712364	10403566001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	20.8	104	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	21.5	108	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	21.3	106	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	22.9	114	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	20.0	100	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	21.2	106	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	21.2	106	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	48.8	98	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20.7	103	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	20.0	100	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	18.3	91	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40.9	102	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	19.6	98	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	21.9	109	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	20.6	103	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	20.5	102	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	20.3	102	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	389	97	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	26.7	133	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	21.4	107	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	89.9	90	58-125	
2-Chlorotoluene	ug/L	<0.20	20	20.5	103	65-138	
2-Hexanone	ug/L	<2.5	100	105	105	61-134	
4-Chlorotoluene	ug/L	<0.13	20	21.3	107	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	104	104	61-130	
Acetone	ug/L	46.8	100	162	115	51-140	
Acrolein	ug/L	<4.8	200	221	111	48-150	
Acrylonitrile	ug/L	<4.9	200	193	97	55-134	
Benzene	ug/L	0.34J	20	19.9	98	63-132	
Bromobenzene	ug/L	<0.16	20	20.5	103	67-138	
Bromochloromethane	ug/L	<0.38	20	19.6	98	66-138	
Bromodichloromethane	ug/L	<0.20	20	20.1	101	75-137	
Bromoform	ug/L	<1.0	20	18.3	91	65-129	
Bromomethane	ug/L	<1.5	20	17.1	86	41-150	
Carbon disulfide	ug/L	<0.37	20	21.0	104	72-132	
Carbon tetrachloride	ug/L	<0.20	20	21.2	106	75-150	
Chlorobenzene	ug/L	<0.14	20	20.5	102	73-127	
Chloroethane	ug/L	<0.44	20	21.2	106	74-138	
Chloroform	ug/L	<0.46	20	18.8	94	74-125	
Chloromethane	ug/L	<1.1	20	19.1	94	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	19.9	99	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	19.3	96	66-129	
Dibromochloromethane	ug/L	<0.13	20	20.4	102	75-133	
Dibromomethane	ug/L	<0.50	20	19.5	97	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	22.0	110	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.3	102	75-129	
Diisopropyl ether	ug/L	<0.12	20	19.5	98	62-128	

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

MATRIX SPIKE SAMPLE: 2712364

Parameter	Units	10403566001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	19.5	98	63-132	
Ethylbenzene	ug/L	<0.14	20	20.8	103	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	28.8	144	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	21.0	105	70-136	
m&p-Xylene	ug/L	<0.24	40	41.9	104	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	19.5	97	72-125	
Methylene Chloride	ug/L	<1.2	20	19.1	95	60-132	
n-Butylbenzene	ug/L	<0.13	20	23.9	119	60-150	
n-Propylbenzene	ug/L	<0.12	20	21.5	108	63-142	
Naphthalene	ug/L	<0.42	20	19.0	95	67-125	
o-Xylene	ug/L	<0.11	20	20.9	104	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	21.8	109	64-146	
sec-Butylbenzene	ug/L	<0.12	20	22.9	114	67-144	
Styrene	ug/L	<0.14	20	19.0	95	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	19.1	96	60-134	
tert-Butyl Alcohol	ug/L	2.3J	200	203	100	56-146	
tert-Butylbenzene	ug/L	<0.15	20	21.8	109	68-135	
Tetrachloroethene	ug/L	<0.16	20	21.0	105	67-148	
Tetrahydrofuran	ug/L	<4.3	200	251	126	51-141	
Toluene	ug/L	0.35J	20	20.2	100	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	21.0	105	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	19.4	97	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	46.1	92	30-150	
Trichloroethene	ug/L	<0.18	20	20.4	102	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	23.1	116	75-150	
Vinyl acetate	ug/L	<1.5	20	20.2	101	49-143	
Vinyl chloride	ug/L	<0.096	20	22.0	110	75-133	
Xylene (Total)	ug/L	<0.24	60	62.8	105	63-142	
1,2-Dichloroethane-d4 (S)	%				101	75-137	
4-Bromofluorobenzene (S)	%				100	75-125	
Toluene-d8 (S)	%				105	75-125	

SAMPLE DUPLICATE: 2712365

Parameter	Units	10403566002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

SAMPLE DUPLICATE: 2712365

Parameter	Units	10403566002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	18.2J		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

SAMPLE DUPLICATE: 2712365

Parameter	Units	10403566002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	108	107	1		
4-Bromofluorobenzene (S)	%	100	102	2		
Toluene-d8 (S)	%	103	104	1		

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## QUALIFIERS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 498839

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10404191

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10404191001	FD01-GW-091917	EPA 8260B	498839		
10404191002	FD02-GW-091917	EPA 8260B	498839		
10404191003	TB-091917	EPA 8260B	498839		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10404191

### Section A

#### Required Client Information:

Company: UPRR  
 Address: 1400 W. 52nd Ave.  
 Denver, CO 80221  
 Email: atheria@up.com  
 Phone: ~~Max~~  
 Requested Due Date: 24 Hr / ~~3 Day~~ / 10 Day

### Section B

#### Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order #  
 Project Name: Freeman, WA - Cenex Harvest Lease  
 Project #:

### Section C

#### Invoice Information:

Attention: Anne Theriault (atheria@up.com)  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447 / 4

Page: 1 Of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analysis Test Y/N	Requested Analysis Filtered (Y/N)				State / Location WA / Freeman
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8260	6020 Total Iron	6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus	
1	FD01-GW-091917			WTG		9-19-17	1500			3												001	Field Dup
2	FD02-GW-091917			LL		1	1530			3												002	Field Dup
3	TB-091917			LL		1	0700			2													Trip Blank
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Field filtered by client	CHR2M/4KB	9/20/17	1515	JR/PACE	9/21/17	1245	4.5	X	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: LK Baumann

SIGNATURE of SAMPLER: *[Signature]* DATE Signed: 9-20-17

TEMP in C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)


Samples Intact (Y/N)

**Sample Condition Upon Receipt**

Client Name: UPRR

Project #:

WO#: 10404191



10404191

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_  
 Tracking Number: 7448-1032-6590

Custody Seal on Cooler/Box Present?  Yes     No    Seals Intact?  Yes     No    Optional: Proj. Due Date:    Proj. Name:

Packing Material:  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_    Temp Blank?  Yes     No

Thermometer Used:  151401163     G87A9155100842    Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun

Cooler Temp Read (°C): 5.0    Cooler Temp Corrected (°C): 4.5    Biological Tissue Frozen?  Yes     No     N/A  
 Temp should be above freezing to 6°C    Correction Factor: -0.5    Date and Initials of Person Examining Contents: 9/21/17 JD

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , pH, NaOH >9 Sulfide, NaOH >12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exception: VOA Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed:    Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>201 1/3 L Lamm, 002 3/3 L Lamm</u>
Trip Blank Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>Shared TB w/ WO# 10404181</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>131503</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_    Field Data Required?  Yes     No  
 Comments/Resolution: \_\_\_\_\_

Project Manager Review: JENNI GROSS    Date: 09/21/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

September 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

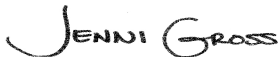
RE: Project: Freeman, WA - Cenex Harvest Le  
Pace Project No.: 10404887

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 27, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10404887001	Silva-GW-092517	Water	09/25/17 11:40	09/27/17 09:50
10404887002	Trip Blank	Water	09/25/17 00:00	09/27/17 09:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10404887001	Silva-GW-092517	EPA 8260B	DJB	83	PASI-M
10404887002	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10404887001</b>	<b>Silva-GW-092517</b>					
EPA 8260B	Acetone	30.3	ug/L	20.0	09/28/17 06:59	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** September 28, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 499237

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

**Sample: Silva-GW-092517**      **Lab ID: 10404887001**      Collected: 09/25/17 11:40      Received: 09/27/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/28/17 06:59	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/28/17 06:59	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/28/17 06:59	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/28/17 06:59	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/28/17 06:59	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/28/17 06:59	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/28/17 06:59	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/28/17 06:59	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/28/17 06:59	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/28/17 06:59	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/28/17 06:59	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/28/17 06:59	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/28/17 06:59	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/28/17 06:59	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/28/17 06:59	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/28/17 06:59	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/28/17 06:59	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/28/17 06:59	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/28/17 06:59	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/28/17 06:59	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/28/17 06:59	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/28/17 06:59	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/28/17 06:59	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/28/17 06:59	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/28/17 06:59	108-10-1	
Acetone	30.3	ug/L	20.0	8.8	1		09/28/17 06:59	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/28/17 06:59	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/28/17 06:59	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/28/17 06:59	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/28/17 06:59	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/28/17 06:59	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/28/17 06:59	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/28/17 06:59	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/28/17 06:59	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/28/17 06:59	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/28/17 06:59	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/28/17 06:59	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/28/17 06:59	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

**Sample: Silva-GW-092517**      **Lab ID: 10404887001**      Collected: 09/25/17 11:40      Received: 09/27/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/28/17 06:59	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/28/17 06:59	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/28/17 06:59	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/28/17 06:59	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/28/17 06:59	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/28/17 06:59	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/28/17 06:59	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/28/17 06:59	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/28/17 06:59	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/28/17 06:59	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/28/17 06:59	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/28/17 06:59	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/28/17 06:59	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/28/17 06:59	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/28/17 06:59	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/28/17 06:59	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/28/17 06:59	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/28/17 06:59	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/28/17 06:59	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/28/17 06:59	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/28/17 06:59	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/28/17 06:59	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/28/17 06:59	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/28/17 06:59	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/28/17 06:59	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/28/17 06:59	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/28/17 06:59	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	109	%	75-137		1		09/28/17 06:59	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1		09/28/17 06:59	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		09/28/17 06:59	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

**Sample: Trip Blank**      **Lab ID: 10404887002**      Collected: 09/25/17 00:00      Received: 09/27/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		09/28/17 01:07	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		09/28/17 01:07	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		09/28/17 01:07	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		09/28/17 01:07	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		09/28/17 01:07	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		09/28/17 01:07	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		09/28/17 01:07	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		09/28/17 01:07	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		09/28/17 01:07	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		09/28/17 01:07	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		09/28/17 01:07	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		09/28/17 01:07	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		09/28/17 01:07	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		09/28/17 01:07	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		09/28/17 01:07	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		09/28/17 01:07	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		09/28/17 01:07	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		09/28/17 01:07	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		09/28/17 01:07	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		09/28/17 01:07	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		09/28/17 01:07	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		09/28/17 01:07	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		09/28/17 01:07	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		09/28/17 01:07	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		09/28/17 01:07	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		09/28/17 01:07	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		09/28/17 01:07	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		09/28/17 01:07	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		09/28/17 01:07	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		09/28/17 01:07	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		09/28/17 01:07	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		09/28/17 01:07	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		09/28/17 01:07	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		09/28/17 01:07	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		09/28/17 01:07	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		09/28/17 01:07	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		09/28/17 01:07	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		09/28/17 01:07	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman, WA - Cenex Harvest Le

Project No.: 10404887

Sample: Trip Blank      Lab ID: 10404887002      Collected: 09/25/17 00:00      Received: 09/27/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		09/28/17 01:07	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		09/28/17 01:07	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		09/28/17 01:07	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		09/28/17 01:07	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		09/28/17 01:07	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		09/28/17 01:07	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		09/28/17 01:07	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		09/28/17 01:07	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		09/28/17 01:07	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		09/28/17 01:07	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		09/28/17 01:07	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		09/28/17 01:07	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		09/28/17 01:07	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		09/28/17 01:07	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		09/28/17 01:07	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		09/28/17 01:07	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		09/28/17 01:07	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		09/28/17 01:07	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		09/28/17 01:07	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		09/28/17 01:07	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		09/28/17 01:07	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		09/28/17 01:07	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		09/28/17 01:07	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		09/28/17 01:07	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		09/28/17 01:07	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		09/28/17 01:07	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		09/28/17 01:07	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		09/28/17 01:07	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1		09/28/17 01:07	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		09/28/17 01:07	460-00-4	

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le  
Pace Project No.: 10404887

QC Batch: 499237 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10404887001, 10404887002

METHOD BLANK: 2714160 Matrix: Water  
Associated Lab Samples: 10404887001, 10404887002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	09/28/17 00:43	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	09/28/17 00:43	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	09/28/17 00:43	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	09/28/17 00:43	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	09/28/17 00:43	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	09/28/17 00:43	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	09/28/17 00:43	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	09/28/17 00:43	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	09/28/17 00:43	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	09/28/17 00:43	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	09/28/17 00:43	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	09/28/17 00:43	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	09/28/17 00:43	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	09/28/17 00:43	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	09/28/17 00:43	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	09/28/17 00:43	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	09/28/17 00:43	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	09/28/17 00:43	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	09/28/17 00:43	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	09/28/17 00:43	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	09/28/17 00:43	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	09/28/17 00:43	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	09/28/17 00:43	
2-Hexanone	ug/L	<2.5	5.0	2.5	09/28/17 00:43	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	09/28/17 00:43	
Acetone	ug/L	<8.8	20.0	8.8	09/28/17 00:43	
Acrolein	ug/L	<4.8	10.0	4.8	09/28/17 00:43	
Acrylonitrile	ug/L	<4.9	10.0	4.9	09/28/17 00:43	
Benzene	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
Bromobenzene	ug/L	<0.16	0.50	0.16	09/28/17 00:43	
Bromochloromethane	ug/L	<0.38	1.0	0.38	09/28/17 00:43	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	09/28/17 00:43	
Bromoform	ug/L	<1.0	4.0	1.0	09/28/17 00:43	
Bromomethane	ug/L	<1.5	4.0	1.5	09/28/17 00:43	
Carbon disulfide	ug/L	<0.37	1.0	0.37	09/28/17 00:43	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	09/28/17 00:43	

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

METHOD BLANK: 2714160

Matrix: Water

Associated Lab Samples: 10404887001, 10404887002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
Chloroethane	ug/L	<0.44	1.0	0.44	09/28/17 00:43	
Chloroform	ug/L	<0.46	1.0	0.46	09/28/17 00:43	
Chloromethane	ug/L	<1.1	4.0	1.1	09/28/17 00:43	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	09/28/17 00:43	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	09/28/17 00:43	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
Dibromomethane	ug/L	<0.50	1.0	0.50	09/28/17 00:43	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	09/28/17 00:43	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	09/28/17 00:43	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	09/28/17 00:43	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
Ethylbenzene	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	09/28/17 00:43	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
m&p-Xylene	ug/L	<0.24	1.0	0.24	09/28/17 00:43	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
Methylene Chloride	ug/L	<1.2	4.0	1.2	09/28/17 00:43	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	09/28/17 00:43	
Naphthalene	ug/L	<0.42	1.0	0.42	09/28/17 00:43	
o-Xylene	ug/L	<0.11	0.50	0.11	09/28/17 00:43	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	09/28/17 00:43	
Styrene	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	09/28/17 00:43	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	09/28/17 00:43	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	09/28/17 00:43	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	09/28/17 00:43	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	09/28/17 00:43	
Toluene	ug/L	<0.17	0.50	0.17	09/28/17 00:43	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	09/28/17 00:43	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	09/28/17 00:43	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	09/28/17 00:43	
Trichloroethene	ug/L	<0.18	0.40	0.18	09/28/17 00:43	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	09/28/17 00:43	
Vinyl acetate	ug/L	<1.5	10.0	1.5	09/28/17 00:43	
Vinyl chloride	ug/L	<0.096	0.20	0.096	09/28/17 00:43	
Xylene (Total)	ug/L	<0.24	1.5	0.24	09/28/17 00:43	
1,2-Dichloroethane-d4 (S)	%	106	75-137		09/28/17 00:43	
4-Bromofluorobenzene (S)	%	101	75-125		09/28/17 00:43	
Toluene-d8 (S)	%	104	75-125		09/28/17 00:43	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le  
Pace Project No.: 10404887

LABORATORY CONTROL SAMPLE & LCSD: 2714161		2714162								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.4	20.7	102	103	75-136	2	30	
1,1,1-Trichloroethane	ug/L	20	20.4	20.5	102	103	75-129	0	30	
1,1,2,2-Tetrachloroethane	ug/L	20	20.8	21.0	104	105	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	21.0	21.6	105	108	75-125	3	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.4	20.3	97	102	69-126	5	30	
1,1-Dichloroethane	ug/L	20	20.4	20.3	102	102	75-125	0	30	
1,1-Dichloroethene	ug/L	20	20.0	20.3	100	102	75-125	2	30	
1,1-Dichloropropene	ug/L	20	20.0	20.3	100	101	75-125	1	30	
1,2,3-Trichlorobenzene	ug/L	20	19.6	21.7	98	108	75-125	10	30	
1,2,3-Trichloropropane	ug/L	20	20.6	21.7	103	109	75-125	5	30	
1,2,4-Trichlorobenzene	ug/L	20	19.1	20.1	96	101	75-125	5	30	
1,2,4-Trimethylbenzene	ug/L	20	21.1	21.6	105	108	75-125	3	30	
1,2-Dibromo-3-chloropropane	ug/L	50	47.9	50.2	96	100	71-130	5	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.5	21.4	102	107	75-125	4	30	
1,2-Dichlorobenzene	ug/L	20	20.6	20.8	103	104	75-125	1	30	
1,2-Dichloroethane	ug/L	20	18.6	18.6	93	93	70-125	0	30	
1,2-Dichloroethene (Total)	ug/L	40	39.8	40.1	100	100	75-125	1	30	
1,2-Dichloropropane	ug/L	20	20.0	19.8	100	99	75-125	1	30	
1,3,5-Trimethylbenzene	ug/L	20	21.8	22.0	109	110	75-125	1	30	
1,3-Dichlorobenzene	ug/L	20	20.6	21.2	103	106	75-125	3	30	
1,3-Dichloropropane	ug/L	20	20.4	21.4	102	107	75-125	5	30	
1,4-Dichlorobenzene	ug/L	20	20.3	20.7	102	103	75-125	2	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	413	365	103	91	64-140	13	30	
2,2,4-Trimethylpentane	ug/L	20	18.1	18.1	91	91	68-125	0	30	
2,2-Dichloropropane	ug/L	20	18.8	18.6	94	93	70-131	1	30	
2-Butanone (MEK)	ug/L	100	93.5	92.7	94	93	69-125	1	30	
2-Chlorotoluene	ug/L	20	20.8	21.2	104	106	75-125	2	30	
2-Hexanone	ug/L	100	108	112	108	112	73-129	3	30	
4-Chlorotoluene	ug/L	20	21.4	22.1	107	110	75-125	3	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	107	110	107	110	73-125	3	30	
Acetone	ug/L	100	87.9	91.8	88	92	66-126	4	30	
Acrolein	ug/L	200	172	185	86	93	56-150	8	30	
Acrylonitrile	ug/L	200	197	201	99	101	68-129	2	30	
Benzene	ug/L	20	19.6	19.6	98	98	75-125	0	30	
Bromobenzene	ug/L	20	21.2	21.7	106	108	75-125	2	30	
Bromochloromethane	ug/L	20	19.5	19.7	98	99	75-126	1	30	
Bromodichloromethane	ug/L	20	19.6	20.2	98	101	75-133	3	30	
Bromoform	ug/L	20	17.6	18.3	88	92	62-142	4	30	
Bromomethane	ug/L	20	12.9	16.0	65	80	34-143	21	30	
Carbon disulfide	ug/L	20	18.2	18.7	91	93	71-125	2	30	
Carbon tetrachloride	ug/L	20	19.7	20.6	98	103	71-145	5	30	
Chlorobenzene	ug/L	20	20.3	20.8	101	104	75-125	3	30	
Chloroethane	ug/L	20	21.2	21.6	106	108	75-125	2	30	
Chloroform	ug/L	20	18.9	19.0	94	95	75-125	1	30	
Chloromethane	ug/L	20	17.9	17.8	89	89	54-125	0	30	
cis-1,2-Dichloroethene	ug/L	20	19.9	20.0	99	100	75-125	1	30	
cis-1,3-Dichloropropene	ug/L	20	19.5	19.7	97	99	75-125	1	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le  
Pace Project No.: 10404887

LABORATORY CONTROL SAMPLE & LCSD:		2714161		2714162							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	19.6	20.5	98	103	74-141	5	30		
Dibromomethane	ug/L	20	19.5	19.6	98	98	75-125	1	30		
Dichlorodifluoromethane	ug/L	20	19.6	19.8	98	99	59-130	1	30		
Dichlorofluoromethane	ug/L	20	20.3	20.5	102	102	75-125	1	30		
Diisopropyl ether	ug/L	20	18.7	19.1	94	95	69-125	2	30		
Ethyl-tert-butyl ether	ug/L	20	19.1	19.8	96	99	73-125	3	30		
Ethylbenzene	ug/L	20	20.7	21.0	103	105	75-125	2	30		
Hexachloro-1,3-butadiene	ug/L	20	19.5	20.8	97	104	75-131	6	30		
Isopropylbenzene (Cumene)	ug/L	20	20.6	21.1	103	105	75-125	2	30		
m&p-Xylene	ug/L	40	42.5	42.8	106	107	75-125	1	30		
Methyl-tert-butyl ether	ug/L	20	19.2	19.6	96	98	75-125	2	30		
Methylene Chloride	ug/L	20	19.0	19.2	95	96	73-125	1	30		
n-Butylbenzene	ug/L	20	20.1	21.0	100	105	75-125	4	30		
n-Propylbenzene	ug/L	20	21.3	21.7	106	108	75-125	2	30		
Naphthalene	ug/L	20	18.2	20.3	91	102	74-125	11	30		
o-Xylene	ug/L	20	20.6	21.5	103	107	75-125	4	30		
p-Isopropyltoluene	ug/L	20	19.8	20.4	99	102	75-125	3	30		
sec-Butylbenzene	ug/L	20	20.9	21.5	105	107	75-125	3	30		
Styrene	ug/L	20	18.8	19.1	94	96	75-125	2	30		
tert-Amylmethyl ether	ug/L	20	18.9	19.2	94	96	71-126	1	30		
tert-Butyl Alcohol	ug/L	200	218	203	109	101	69-131	7	30		
tert-Butylbenzene	ug/L	20	21.1	21.7	105	108	75-125	3	30		
Tetrachloroethene	ug/L	20	20.6	20.8	103	104	75-125	1	30		
Tetrahydrofuran	ug/L	200	173	185	87	92	65-127	7	30		
Toluene	ug/L	20	20.3	20.4	101	102	75-125	1	30		
trans-1,2-Dichloroethene	ug/L	20	20.0	20.1	100	101	75-125	1	30		
trans-1,3-Dichloropropene	ug/L	20	19.1	19.2	95	96	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	45.6	47.7	91	95	30-150	4	30		
Trichloroethene	ug/L	20	20.6	20.1	103	101	75-125	2	30		
Trichlorofluoromethane	ug/L	20	20.9	21.4	104	107	71-140	3	30		
Vinyl acetate	ug/L	20	19.2	19.7	96	99	68-137	3	30		
Vinyl chloride	ug/L	20	20.5	21.2	103	106	70-125	3	30		
Xylene (Total)	ug/L	60	63.1	64.2	105	107	75-125	2	30		
1,2-Dichloroethane-d4 (S)	%				104	104	75-137				
4-Bromofluorobenzene (S)	%				99	101	75-125				
Toluene-d8 (S)	%				103	107	75-125				

MATRIX SPIKE SAMPLE:		2714163		10404898001							
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	19.7	99	75-137					
1,1,1-Trichloroethane	ug/L	<0.15	20	20.2	101	75-139					
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	19.8	99	60-142					
1,1,2-Trichloroethane	ug/L	<0.22	20	20.2	101	75-128					
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	22.4	112	62-150					

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

MATRIX SPIKE SAMPLE:	2714163	10404898001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	19.6	98	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	20.1	100	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	19.8	99	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20.7	104	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	19.1	95	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	19.1	95	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20.3	101	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	46.4	93	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	19.6	98	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	20.0	100	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	17.7	88	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	38.6	97	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	18.5	92	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20.9	104	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	19.8	99	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	19.7	98	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	19.5	98	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	404	101	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	20.5	103	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	18.5	92	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	87.9	88	58-125	
2-Chlorotoluene	ug/L	<0.20	20	20.0	100	65-138	
2-Hexanone	ug/L	<2.5	100	105	105	61-134	
4-Chlorotoluene	ug/L	<0.13	20	20.7	104	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	102	102	61-130	
Acetone	ug/L	<8.8	100	118	118	51-140	
Acrolein	ug/L	<4.8	200	235	117	48-150	
Acrylonitrile	ug/L	<4.9	200	185	92	55-134	
Benzene	ug/L	<0.13	20	19.0	95	63-132	
Bromobenzene	ug/L	<0.16	20	20.2	101	67-138	
Bromochloromethane	ug/L	<0.38	20	18.4	92	66-138	
Bromodichloromethane	ug/L	<0.20	20	19.0	95	75-137	
Bromoform	ug/L	<1.0	20	17.1	86	65-129	
Bromomethane	ug/L	<1.5	20	16.2	81	41-150	
Carbon disulfide	ug/L	<0.37	20	18.9	94	72-132	
Carbon tetrachloride	ug/L	<0.20	20	20.8	104	75-150	
Chlorobenzene	ug/L	<0.14	20	20.0	100	73-127	
Chloroethane	ug/L	<0.44	20	21.2	106	74-138	
Chloroform	ug/L	<0.46	20	18.1	90	74-125	
Chloromethane	ug/L	<1.1	20	18.3	91	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	19.4	97	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	17.6	88	66-129	
Dibromochloromethane	ug/L	<0.13	20	19.3	97	75-133	
Dibromomethane	ug/L	<0.50	20	18.3	92	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	21.9	110	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.0	100	75-129	
Diisopropyl ether	ug/L	<0.12	20	18.5	92	62-128	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

MATRIX SPIKE SAMPLE: 2714163		10404898001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	18.3	92	63-132	
Ethylbenzene	ug/L	<0.14	20	20.8	104	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20.4	102	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20.7	103	70-136	
m&p-Xylene	ug/L	<0.24	40	41.6	104	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	18.3	91	72-125	
Methylene Chloride	ug/L	<1.2	20	18.1	90	60-132	
n-Butylbenzene	ug/L	<0.13	20	20.5	102	60-150	
n-Propylbenzene	ug/L	<0.12	20	20.9	104	63-142	
Naphthalene	ug/L	<0.42	20	19.0	95	67-125	
o-Xylene	ug/L	<0.11	20	20.3	101	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	19.7	98	64-146	
sec-Butylbenzene	ug/L	<0.12	20	21.0	105	67-144	
Styrene	ug/L	<0.14	20	18.2	91	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	18.1	91	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	209	105	56-146	
tert-Butylbenzene	ug/L	<0.15	20	20.3	102	68-135	
Tetrachloroethene	ug/L	<0.16	20	20.5	103	67-148	
Tetrahydrofuran	ug/L	<4.3	200	241	120	51-141	
Toluene	ug/L	<0.17	20	19.7	99	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	19.2	96	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	18.3	92	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	42.9	86	30-150	
Trichloroethene	ug/L	<0.18	20	19.4	97	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	22.4	112	75-150	
Vinyl acetate	ug/L	<1.5	20	16.4	82	49-143	
Vinyl chloride	ug/L	<0.096	20	21.7	108	75-133	
Xylene (Total)	ug/L	<0.24	60	61.9	103	63-142	
1,2-Dichloroethane-d4 (S)	%				104	75-137	
4-Bromofluorobenzene (S)	%				100	75-125	
Toluene-d8 (S)	%				105	75-125	

SAMPLE DUPLICATE: 2714164

Parameter	Units	10404898002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

SAMPLE DUPLICATE: 2714164

Parameter	Units	10404898002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

SAMPLE DUPLICATE: 2714164

Parameter	Units	10404898002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	108	105	3		
4-Bromofluorobenzene (S)	%	101	101	0		
Toluene-d8 (S)	%	105	105	0		

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 499237

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman, WA - Cenex Harvest Le

Pace Project No.: 10404887

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10404887001	Silva-GW-092517	EPA 8260B	499237		
10404887002	Trip Blank	EPA 8260B	499237		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10404887

Page: 1 of 1

**Section A**

**Required Client Information:**

Company: UPRR  
 Address: 1400 W. 52nd Ave.  
 Denver, CO 80221  
 Email: atheria@up.com  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date: 24 Hr / 3 Day / 10 Day

**Section B**

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # \_\_\_\_\_  
 Project Name: Freeman, WA - Cenex Harvest Lease  
 Project #: \_\_\_\_\_

**Section C**

**Invoice Information:**

Attention: Anne Theriault (atheria@up.com)  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: \_\_\_\_\_ Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447 / 4

Regulatory Agency \_\_\_\_\_  
 State / Location \_\_\_\_\_  
 WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMPI)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test Y/N	Requested Analysis Filtered (Y/N)				State / Location		
						START DATE	END DATE			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Low Level VOCs by 8260		6020 Total Iron	6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus	Y			
																							TIME	TIME
1	Silva-GW-092517			OT			9/25/17	11:40	3			X						X					WA / Freeman	
2	Trip Blank			WT					2			X						X						WA / Freeman
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS					
*Field filtered by client	JR DeKalum	9-15-17	16:00	[Signature]	9/25/17	9:50	Y	Y	Y	Y		

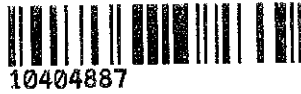
Page 22 of 23

<b>SAMPLER NAME AND SIGNATURE</b>		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Steve Demus					
SIGNATURE of SAMPLER:	[Signature]	DATE Signed: 9-25-17				

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: UPRR

Project #: **WO#: 10404887**



Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_

Tracking Number: 7475 9634 7542

Custody Seal on Cooler/Box Present?  Yes     No    Seals Intact?  Yes     No

Packing Material:  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_

Thermometer  151401163  
 Used:  A9155100842

Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun

Cooler Temp Read (°C): 4.9    Cooler Temp Corrected (°C): 4.4    Biological Tissue Frozen?  Yes     No     N/A  
 Temp should be above freezing to 6°C    Correction Factor: -0.5    Date and Initials of Person Examining Contents: BT 9/27/17

USDA Regulated Soil  N/A, water sample

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed:    Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>132506</u>	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1240</u>	Temp: <u>4.9</u>	Corrected Temp: <u>4.4</u>
Time: <u>1245</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_

JENNI GROSS

Date: 09/27/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 09, 2017

David Hodson  
CH2M Hill  
9451 Atkinson St  
Suite 100  
Roseville, CA 95747

RE: Project: Freeman, WA-Cenex Harvest Leas  
Pace Project No.: 10405356

Dear David Hodson:

Enclosed are the analytical results for sample(s) received by the laboratory on September 29, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Chris Bremer  
chris.bremer@pacelabs.com  
1(612)607-6390  
Project Manager

Enclosures

cc: Jim Hartley, CH2M  
UPRR-Sysdat@ghd.com, UPRR  
Lauren Wu, CH2M



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10405356001	Marlow-CSV-092717	Air	09/27/17 10:37	09/29/17 09:50
10405356002	Marlow-CSV-092717 Cert #0849	Air	09/27/17 10:37	09/29/17 09:50
10405356003	FD-CSV-092717	Air	09/27/17 10:37	09/29/17 09:50
10405356004	FD-CSV-092717 Cert #2115	Air	09/27/17 10:37	09/29/17 09:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10405356001	Marlow-CSV-092717	TO-15	MJL	2	PASI-M
10405356002	Marlow-CSV-092717 Cert #0849	TO-15	DR1	2	PASI-M
10405356003	FD-CSV-092717	TO-15	MJL	2	PASI-M
10405356004	FD-CSV-092717 Cert #2115	TO-15	DR1	2	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10405356001</b>	<b>Marlow-CSV-092717</b>					
TO-15	Carbon tetrachloride	0.80	ug/m3	0.048	10/06/17 16:10	
TO-15	Chloroform	0.088	ug/m3	0.037	10/06/17 16:10	
<b>10405356003</b>	<b>FD-CSV-092717</b>					
TO-15	Carbon tetrachloride	0.66	ug/m3	0.048	10/06/17 16:37	
TO-15	Chloroform	0.097	ug/m3	0.037	10/06/17 16:37	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

---

**Method:** TO-15

**Description:** TO15 MSV AIR SIM SCAN

**Client:** UPRR\_CH2M Hill

**Date:** October 09, 2017

**General Information:**

4 samples were analyzed for TO-15. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

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**Sample: Marlow-CSV-092717**      **Lab ID: 10405356001**      Collected: 09/27/17 10:37      Received: 09/29/17 09:50      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<b>0.80</b>	ug/m3	0.048	0.0047	1.49		10/06/17 16:10	56-23-5	
Chloroform	<b>0.088</b>	ug/m3	0.037	0.0055	1.49		10/06/17 16:10	67-66-3	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

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**Sample:** Marlow-CSV-092717 Cert    **Lab ID:** 10405356002    Collected: 09/27/17 10:37    Received: 09/29/17 09:50    Matrix: Air  
**#0849**

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<0.0032	ug/m3	0.64	0.0032	1		08/23/17 10:47	56-23-5	
Chloroform	<0.0037	ug/m3	0.50	0.0037	1		08/23/17 10:47	67-66-3	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

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**Sample: FD-CSV-092717**      **Lab ID: 10405356003**      Collected: 09/27/17 10:37      Received: 09/29/17 09:50      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<b>0.66</b>	ug/m3	0.048	0.0047	1.49		10/06/17 16:37	56-23-5	
Chloroform	<b>0.097</b>	ug/m3	0.037	0.0055	1.49		10/06/17 16:37	67-66-3	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

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**Sample: FD-CSV-092717 Cert #2115    Lab ID: 10405356004**    Collected: 09/27/17 10:37    Received: 09/29/17 09:50    Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<0.0032	ug/m3	0.64	0.0032	1		08/22/17 11:15	56-23-5	
Chloroform	<0.0037	ug/m3	0.50	0.0037	1		08/22/17 11:15	67-66-3	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

QC Batch: 500869

Analysis Method: TO-15

QC Batch Method: TO-15

Analysis Description: TO15 MSV AIR SIM SCAN

Associated Lab Samples: 10405356001, 10405356003

METHOD BLANK: 2722872

Matrix: Air

Associated Lab Samples: 10405356001, 10405356003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbon tetrachloride	ug/m3	<0.0032	0.032	0.0032	10/06/17 15:16	
Chloroform	ug/m3	<0.0037	0.025	0.0037	10/06/17 15:16	

LABORATORY CONTROL SAMPLE: 2722873

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbon tetrachloride	ug/m3	.68	0.82	119	70-130	
Chloroform	ug/m3	.51	0.53	104	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405356

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10405356001	Marlow-CSV-092717	TO-15	500869		
10405356002	Marlow-CSV-092717 Cert #0849	TO-15	501319		
10405356003	FD-CSV-092717	TO-15	500869		
10405356004	FD-CSV-092717 Cert #2115	TO-15	501319		

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# AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10405356

27933

Page: 1 of 1

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:	<b>Program</b>
Company: <b>UPRR</b>	Report To: <b>Monk Ochsner, David Hodson</b>	Attention: <b>Anne Theriault (atheria@up.com)</b>	<input type="checkbox"/> UST <input checked="" type="checkbox"/> Superfund <input type="checkbox"/> Emissions <input type="checkbox"/> Clean Air Act <input type="checkbox"/> Voluntary Clean Up <input type="checkbox"/> Dry Clean <input type="checkbox"/> RCRA <input type="checkbox"/> Other
Address: <b>1400 W. 52nd Ave</b>	Copy To: <b>Steve Demus, Lindsay Baumann</b>	Company Name: <b>UPRR</b>	
<b>Denver CO 80221</b>	<b>UPRR-Sysdot@ghd.com</b>	Address: <b>1400 W. 52nd Ave Denver CO 80221</b>	Location of Sampling by State: <b>WA</b>
Email To: <b>atheria@up.com</b>	Purchase Order No.:	Pace Quote Reference: <b>contract #758938</b>	Reporting Units ug/m <sup>3</sup> mg/m <sup>3</sup> PPBV PPMV Other
Phone: Fax:	Project Name: <b>Freeman, WA - Conex Harvest Lease</b>	Pace Project Manager/Sales Rep: <b>Chris Bremer</b>	Report Level: <b>II</b> , <b>III</b> , <b>IV</b> , Other
Requested Due Date/TAT:	Project Number:	Pace Profile #:	

ITEM #	'Section D Required Client Information <b>AIR SAMPLE ID</b> Sample IDs MUST BE UNIQUE	Valid Media Codes MEDIA CODE Tedlar Bag TB 1 Liter Summa Can 1LC 6 Liter Summa Can 6LC Low Volume Puff LVP High Volume Puff HVP Other PM10	MEDIA CODE	PID Reading (Client only)	COLLECTED				Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	Method:								Pace Lab ID		
					COMPOSITE START END/GRAB		COMPOSITE -						PM10	3c-Fixed Gas (%)	TO3	TO3M (Methane)	TO4 (PCBs)	TO13 (PAH)	TO14	TO15		TO15 Short List	
					DATE	TIME	DATE	TIME															
1	Marlow-CSV-092717		6LC		9-26-17	1300	9-27-17	1037	28.01	2.11	0849	1276									X	001, 002	
2	FD-CSV-092717		6LC		9-26-17	1300	9-27-17	1037	28.10	2.18	2115	1276										X	003, 004
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Comments :	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
	<i>JKB/CH2M</i>	9-27-17	1630	<i>M PALE</i>	9/29/17	950	AMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
PRINT Name of SAMPLER: <i>Lindsay Baumann</i>					
SIGNATURE of SAMPLER: <i>[Signature]</i> DATE Signed (MM/DD/YY) <i>09/27/17</i>					

ORIGINAL

Page 14 of 15



**Air Sample Condition Upon Receipt**

Client Name: UPRR

Project #: \_\_\_\_\_

**WO#: 10405356**



Courier:  Fed Ex  UPS  Speedee  Client

Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: 7448 1032 6920

Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  Foam  None  Tin Can  Other: \_\_\_\_\_

Temp Blank rec:  Yes  No

Temp. (TO17 and TO13 samples only) (°C): \_\_\_\_\_ Corrected Temp (°C): \_\_\_\_\_ Thermom. Used: \_\_\_\_\_

Temp should be above freezing to 6°C Correction Factor: \_\_\_\_\_

Date & Initials of Person Examining Contents: MDJS 9/29/17  
 151401163  
 687A9155A00847

Type of ice Received  Blue  Wet  None

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		10.
Media: <u>Air Can</u> Airbag Filter TDT Passive			11. Individually Certified Cans <u>Y</u> N (list which samples)
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		12.

Samples Received: 5im cans, twin controller

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Project Manager Review: Chris Bremer

Date: 10/2/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 09, 2017

David Hodson  
CH2M Hill  
9451 Atkinson St  
Suite 100  
Roseville, CA 95747

RE: Project: Freeman, WA-Cenex Harvest Leas  
Pace Project No.: 10405357

Dear David Hodson:

Enclosed are the analytical results for sample(s) received by the laboratory on September 29, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Chris Bremer  
chris.bremer@pacelabs.com  
1(612)607-6390  
Project Manager

Enclosures

cc: Jim Hartley, CH2M  
UPRR-Sysdat@ghd.com, UPRR  
Lauren Wu, CH2M



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10405357001	Randall-CSV-092717	Air	09/27/17 12:02	09/29/17 09:50
10405357002	Randall-CSV-092717 Cert #2822	Air	09/27/17 12:02	09/29/17 09:50
10405357003	Unused Can #1056	Air		09/29/17 09:50

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10405357001	Randall-CSV-092717	TO-15	MJL	2	PASI-M
10405357002	Randall-CSV-092717 Cert #2822	TO-15	MJL	2	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10405357001</b>	<b>Randall-CSV-092717</b>					
TO-15	Carbon tetrachloride	0.90	ug/m3	0.050	10/06/17 15:43	
TO-15	Chloroform	0.11	ug/m3	0.038	10/06/17 15:43	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

---

**Method:** TO-15

**Description:** TO15 MSV AIR SIM SCAN

**Client:** UPRR\_CH2M Hill

**Date:** October 09, 2017

**General Information:**

2 samples were analyzed for TO-15. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

---

**Sample: Randall-CSV-092717**      **Lab ID: 10405357001**      Collected: 09/27/17 12:02      Received: 09/29/17 09:50      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<b>0.90</b>	ug/m3	0.050	0.0049	1.55		10/06/17 15:43	56-23-5	
Chloroform	<b>0.11</b>	ug/m3	0.038	0.0057	1.55		10/06/17 15:43	67-66-3	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

**Sample: Randall-CSV-092717 Cert #2822**      **Lab ID: 10405357002**      Collected: 09/27/17 12:02      Received: 09/29/17 09:50      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>									
	Analytical Method: TO-15								
Carbon tetrachloride	<0.0032	ug/m3	0.64	0.0032	1		08/17/17 14:23	56-23-5	
Chloroform	<0.0037	ug/m3	0.50	0.0037	1		08/17/17 14:23	67-66-3	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

QC Batch: 500869

Analysis Method: TO-15

QC Batch Method: TO-15

Analysis Description: TO15 MSV AIR SIM SCAN

Associated Lab Samples: 10405357001

METHOD BLANK: 2722872

Matrix: Air

Associated Lab Samples: 10405357001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbon tetrachloride	ug/m3	<0.0032	0.032	0.0032	10/06/17 15:16	
Chloroform	ug/m3	<0.0037	0.025	0.0037	10/06/17 15:16	

LABORATORY CONTROL SAMPLE: 2722873

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbon tetrachloride	ug/m3	.68	0.82	119	70-130	
Chloroform	ug/m3	.51	0.53	104	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman, WA-Cenex Harvest Leas

Pace Project No.: 10405357

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10405357001	Randall-CSV-092717	TO-15	500869		
10405357002	Randall-CSV-092717 Cert #2822	TO-15	501319		

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# AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10405357

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:	<b>28037</b>
Company: <b>UPRR</b>	Report To: <b>Mark Ochsner, David Hodson</b>	Attention: <b>Anne Theriault (atheria@up.com)</b>	Page: <u>1</u> of <u>1</u>
Address: <b>1400 W. 52nd Ave</b>	Copy To: <b>Steve Demus, Lindsey Bauman</b>	Company Name: <b>UPRR</b>	Program
<b>Denver CO 80221</b>	<b>UPRR-Sysdat@ghd.com</b>	Address: <b>1400 W. 52nd Ave Denver, CO 80221</b>	<input type="checkbox"/> UST <input checked="" type="checkbox"/> Superfund <input type="checkbox"/> Emissions <input type="checkbox"/> Clean Air Act
Email To: <b>atheria@up.com</b>	Purchase Order No.:	Pace Quote Reference: <b>Contract # 758938</b>	<input type="checkbox"/> Voluntary Clean Up <input type="checkbox"/> Dry Clean <input type="checkbox"/> RCRA <input type="checkbox"/> Other
Phone: _____ Fax: _____	Project Name: <b>Freeman, WA - Cenex Harvest Lease</b>	Pace Project Manager/Sales Rep: <b>Jennifer Gross</b>	Location of Sampling by State: <b>WA</b>
Requested Due Date/TAT:	Project Number:	Pace Profile #:	Reporting Units ug/m <sup>3</sup> _____ mg/m <sup>3</sup> _____ PPBV _____ PPMV _____ Other _____
			Report Level: <u>II</u> <u>III</u> <u>IV</u> Other _____

ITEM #	Section D Required Client Information <b>AIR SAMPLE ID</b> Sample IDs MUST BE UNIQUE	Valid Media Codes MEDIA CODE Tedlar Bag TB 1 Liter Summa Can 1LC 6 Liter Summa Can 6LC Low Volume Puff LVP High Volume Puff HVP Other PM10	MEDIA CODE	PID Reading (Client only)	COLLECTED				Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	Method:							Pace Lab ID			
					COMPOSITE START END/GRAB		COMPOSITE -						PM10	3C - Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14		TO-15	TO-15 Short List*	
					DATE	TIME	DATE	TIME															
1	Randall-CSV-092717		6LC		9-26-17	1310	9-27-17	1202	28.20	3.20	2822	0389									X	001,002	
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Comments :	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		<i>JKB/CH2M</i>	9-27-17	1621	<i>JR PAUC</i>	9/29/17	950	AWB	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N

<b>SAMPLER NAME AND SIGNATURE</b>		Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
PRINT Name of SAMPLER: <b>Lindsey Bauman</b>	SIGNATURE of SAMPLER: <i>[Signature]</i>				
DATE Signed (MM/DD/YY): <b>09/27/17</b>					

ORIGINAL



Document Name:  
Air Sample Condition Upon Receipt  
Document No.:  
F-MN-A-106-rev.12

Document Revised: 30Aug2017  
Page 1 of 1  
Issuing Authority:  
Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: UPRR Project #: \_\_\_\_\_

**WO# : 10405357**

10405357

Courier:  Fed Ex  UPS  Speedee  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: 7448 1032 6926

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  Foam  None  Tin Can  Other: \_\_\_\_\_ Temp Blank rec:  Yes  No

Temp. (TO17 and TO13 samples only) (°C): \_\_\_\_\_ Corrected Temp (°C): \_\_\_\_\_ Thermom. Used:  151401163  
 687A9155/00842

Temp should be above freezing to 6°C Correction Factor: \_\_\_\_\_ Date & Initials of Person Examining Contents: WMS 9/29/17

Type of ice Received  Blue  Wet  None

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.	
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.	
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.	
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.	
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.	
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.	
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.	
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.	
Media: <u>Air Can</u> Airbag Filter TDT Passive		11.	Individually Certified Cans <input checked="" type="checkbox"/> Y <input type="checkbox"/> N (list which samples)
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.	

Samples Received: Sim cans

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
<u>Washed can</u>	<u>1056</u>	<u>        </u>			

CLIENT NOTIFICATION/RESOLUTION  
Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Comments/Resolution: \_\_\_\_\_  
Field Data Required?  Yes  No

Project Manager Review: Chris Bremer Date: 10/2/17  
Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 03, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

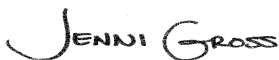
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405436

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on September 30, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: UST-078

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: MN00064

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405436

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10405436001	Silva-GW-092917	Water	09/29/17 09:40	09/30/17 08:50
10405436002	Trip Blank	Water	09/29/17 00:00	09/30/17 08:50

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**SAMPLE ANALYTE COUNT**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405436

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10405436001	Silva-GW-092917	EPA 8260B	DJB	83	PASI-M
10405436002	Trip Blank	EPA 8260B	DJB	83	PASI-M

**REPORT OF LABORATORY ANALYSIS**

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10405436001</b>	<b>Silva-GW-092917</b>					
EPA 8260B	Acetone	26.2	ug/L	20.0	10/03/17 00:46	

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 03, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 500081

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10405436

Sample: **Silva-GW-092917** Lab ID: **10405436001** Collected: 09/29/17 09:40 Received: 09/30/17 08:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/03/17 00:46	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/03/17 00:46	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/03/17 00:46	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/03/17 00:46	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/03/17 00:46	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/03/17 00:46	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/03/17 00:46	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/03/17 00:46	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/03/17 00:46	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/03/17 00:46	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/03/17 00:46	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/03/17 00:46	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/03/17 00:46	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/03/17 00:46	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/03/17 00:46	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/03/17 00:46	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/03/17 00:46	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/03/17 00:46	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/03/17 00:46	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/03/17 00:46	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/03/17 00:46	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/03/17 00:46	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/03/17 00:46	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/03/17 00:46	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/03/17 00:46	108-10-1	
Acetone	26.2	ug/L	20.0	8.8	1		10/03/17 00:46	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/03/17 00:46	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/03/17 00:46	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/03/17 00:46	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/03/17 00:46	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/03/17 00:46	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/03/17 00:46	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/03/17 00:46	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/03/17 00:46	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/03/17 00:46	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/03/17 00:46	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/03/17 00:46	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/03/17 00:46	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10405436

**Sample: Silva-GW-092917**      **Lab ID: 10405436001**      Collected: 09/29/17 09:40      Received: 09/30/17 08:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/03/17 00:46	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/03/17 00:46	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/03/17 00:46	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/03/17 00:46	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/03/17 00:46	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/03/17 00:46	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/03/17 00:46	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/03/17 00:46	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/03/17 00:46	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/03/17 00:46	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/03/17 00:46	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/03/17 00:46	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/03/17 00:46	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/03/17 00:46	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/03/17 00:46	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/03/17 00:46	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/03/17 00:46	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/03/17 00:46	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/03/17 00:46	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/03/17 00:46	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/03/17 00:46	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/03/17 00:46	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/03/17 00:46	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/03/17 00:46	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/03/17 00:46	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/03/17 00:46	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/03/17 00:46	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		10/03/17 00:46	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/03/17 00:46	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		10/03/17 00:46	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

**Sample: Trip Blank**      **Lab ID: 10405436002**      Collected: 09/29/17 00:00      Received: 09/30/17 08:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/02/17 23:59	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/02/17 23:59	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/02/17 23:59	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/02/17 23:59	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/02/17 23:59	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/02/17 23:59	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/02/17 23:59	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/02/17 23:59	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/02/17 23:59	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/02/17 23:59	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/02/17 23:59	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/02/17 23:59	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/02/17 23:59	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/02/17 23:59	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/02/17 23:59	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/02/17 23:59	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/02/17 23:59	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/02/17 23:59	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/02/17 23:59	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/02/17 23:59	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/02/17 23:59	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/02/17 23:59	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/02/17 23:59	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/02/17 23:59	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/02/17 23:59	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		10/02/17 23:59	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/02/17 23:59	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/02/17 23:59	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/02/17 23:59	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/02/17 23:59	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/02/17 23:59	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/02/17 23:59	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/02/17 23:59	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/02/17 23:59	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/02/17 23:59	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/02/17 23:59	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/02/17 23:59	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/02/17 23:59	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

**Sample: Trip Blank**      **Lab ID: 10405436002**      Collected: 09/29/17 00:00      Received: 09/30/17 08:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/02/17 23:59	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/02/17 23:59	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/02/17 23:59	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/02/17 23:59	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/02/17 23:59	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/02/17 23:59	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/02/17 23:59	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/02/17 23:59	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/02/17 23:59	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/02/17 23:59	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/02/17 23:59	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/02/17 23:59	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/02/17 23:59	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/02/17 23:59	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/02/17 23:59	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/02/17 23:59	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/02/17 23:59	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/02/17 23:59	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/02/17 23:59	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/02/17 23:59	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/02/17 23:59	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/02/17 23:59	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/02/17 23:59	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/02/17 23:59	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/02/17 23:59	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/02/17 23:59	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/02/17 23:59	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		10/02/17 23:59	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		10/02/17 23:59	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		10/02/17 23:59	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

QC Batch: 500081

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10405436001, 10405436002

METHOD BLANK: 2719023

Matrix: Water

Associated Lab Samples: 10405436001, 10405436002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/02/17 23:11	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/02/17 23:11	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/02/17 23:11	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/02/17 23:11	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/02/17 23:11	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/02/17 23:11	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/02/17 23:11	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/02/17 23:11	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	10/02/17 23:11	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/02/17 23:11	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/02/17 23:11	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/02/17 23:11	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/02/17 23:11	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/02/17 23:11	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/02/17 23:11	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/02/17 23:11	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/02/17 23:11	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/02/17 23:11	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/02/17 23:11	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/02/17 23:11	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/02/17 23:11	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/02/17 23:11	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/02/17 23:11	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/02/17 23:11	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/02/17 23:11	
Acetone	ug/L	<8.8	20.0	8.8	10/02/17 23:11	
Acrolein	ug/L	<4.8	10.0	4.8	10/02/17 23:11	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/02/17 23:11	
Benzene	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/02/17 23:11	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/02/17 23:11	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/02/17 23:11	
Bromoform	ug/L	<1.0	4.0	1.0	10/02/17 23:11	
Bromomethane	ug/L	<1.5	4.0	1.5	10/02/17 23:11	
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/02/17 23:11	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/02/17 23:11	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

METHOD BLANK: 2719023

Matrix: Water

Associated Lab Samples: 10405436001, 10405436002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
Chloroethane	ug/L	<0.44	1.0	0.44	10/02/17 23:11	
Chloroform	ug/L	<0.46	1.0	0.46	10/02/17 23:11	
Chloromethane	ug/L	<1.1	4.0	1.1	10/02/17 23:11	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/02/17 23:11	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	10/02/17 23:11	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/02/17 23:11	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/02/17 23:11	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/02/17 23:11	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/02/17 23:11	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/02/17 23:11	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/02/17 23:11	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/02/17 23:11	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/02/17 23:11	
Naphthalene	ug/L	<0.42	1.0	0.42	10/02/17 23:11	
o-Xylene	ug/L	<0.11	0.50	0.11	10/02/17 23:11	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/02/17 23:11	
Styrene	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/02/17 23:11	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/02/17 23:11	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/02/17 23:11	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/02/17 23:11	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/02/17 23:11	
Toluene	ug/L	<0.17	0.50	0.17	10/02/17 23:11	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/02/17 23:11	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	10/02/17 23:11	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/02/17 23:11	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/02/17 23:11	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/02/17 23:11	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/02/17 23:11	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/02/17 23:11	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/02/17 23:11	
1,2-Dichloroethane-d4 (S)	%	104	75-137		10/02/17 23:11	
4-Bromofluorobenzene (S)	%	98	75-125		10/02/17 23:11	
Toluene-d8 (S)	%	102	75-125		10/02/17 23:11	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

LABORATORY CONTROL SAMPLE & LCSD: 2719024		2719025								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.9	20.1	105	101	75-136	4	30	
1,1,1-Trichloroethane	ug/L	20	20.1	18.9	100	95	75-129	6	30	
1,1,2,2-Tetrachloroethane	ug/L	20	22.2	22.2	111	111	71-138	0	30	
1,1,2-Trichloroethane	ug/L	20	20.7	20.4	104	102	75-125	2	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.6	18.7	98	94	69-126	5	30	
1,1-Dichloroethane	ug/L	20	20.2	19.2	101	96	75-125	5	30	
1,1-Dichloroethene	ug/L	20	19.5	19.1	97	96	75-125	2	30	
1,1-Dichloropropene	ug/L	20	18.8	18.4	94	92	75-125	2	30	
1,2,3-Trichlorobenzene	ug/L	20	21.5	21.9	107	110	75-125	2	30	
1,2,3-Trichloropropane	ug/L	20	21.5	20.8	107	104	75-125	3	30	
1,2,4-Trichlorobenzene	ug/L	20	18.9	19.0	94	95	75-125	1	30	
1,2,4-Trimethylbenzene	ug/L	20	20.5	20.4	103	102	75-125	1	30	
1,2-Dibromo-3-chloropropane	ug/L	50	57.5	56.0	115	112	71-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	20	21.5	20.9	107	104	75-125	3	30	
1,2-Dichlorobenzene	ug/L	20	19.9	20.4	99	102	75-125	3	30	
1,2-Dichloroethane	ug/L	20	18.1	17.4	90	87	70-125	4	30	
1,2-Dichloroethene (Total)	ug/L	40	40.0	37.7	100	94	75-125	6	30	
1,2-Dichloropropane	ug/L	20	18.7	18.0	93	90	75-125	4	30	
1,3,5-Trimethylbenzene	ug/L	20	20.9	20.6	104	103	75-125	1	30	
1,3-Dichlorobenzene	ug/L	20	20.6	20.6	103	103	75-125	0	30	
1,3-Dichloropropane	ug/L	20	20.3	20.3	102	101	75-125	0	30	
1,4-Dichlorobenzene	ug/L	20	20.4	20.3	102	101	75-125	1	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	403	397	101	99	64-140	1	30	
2,2,4-Trimethylpentane	ug/L	20	16.6	16.2	83	81	68-125	3	30	
2,2-Dichloropropane	ug/L	20	18.5	17.5	93	87	70-131	6	30	
2-Butanone (MEK)	ug/L	100	103	100	103	100	69-125	3	30	
2-Chlorotoluene	ug/L	20	21.0	20.7	105	103	75-125	2	30	
2-Hexanone	ug/L	100	120	118	120	118	73-129	2	30	
4-Chlorotoluene	ug/L	20	21.2	21.1	106	105	75-125	1	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	116	114	116	114	73-125	2	30	
Acetone	ug/L	100	126	119	126	119	66-126	6	30	
Acrolein	ug/L	200	220	214	110	107	56-150	3	30	
Acrylonitrile	ug/L	200	214	208	107	104	68-129	3	30	
Benzene	ug/L	20	19.3	18.8	97	94	75-125	3	30	
Bromobenzene	ug/L	20	20.7	20.8	103	104	75-125	0	30	
Bromochloromethane	ug/L	20	19.8	19.5	99	97	75-126	2	30	
Bromodichloromethane	ug/L	20	19.7	19.1	98	96	75-133	3	30	
Bromoform	ug/L	20	18.7	18.9	93	94	62-142	1	30	
Bromomethane	ug/L	20	17.8	20.1	89	100	34-143	12	30	
Carbon disulfide	ug/L	20	17.6	17.4	88	87	71-125	1	30	
Carbon tetrachloride	ug/L	20	20.3	19.3	102	97	71-145	5	30	
Chlorobenzene	ug/L	20	20.1	19.6	101	98	75-125	2	30	
Chloroethane	ug/L	20	20.5	19.9	102	99	75-125	3	30	
Chloroform	ug/L	20	19.4	18.7	97	94	75-125	3	30	
Chloromethane	ug/L	20	17.8	17.1	89	85	54-125	4	30	
cis-1,2-Dichloroethene	ug/L	20	20.5	19.0	102	95	75-125	7	30	
cis-1,3-Dichloropropene	ug/L	20	18.2	18.1	91	91	75-125	0	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

LABORATORY CONTROL SAMPLE & LCSD: 2719024		2719025								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	19.9	19.7	99	98	74-141	1	30	
Dibromomethane	ug/L	20	20.2	19.6	101	98	75-125	3	30	
Dichlorodifluoromethane	ug/L	20	18.3	17.6	92	88	59-130	4	30	
Dichlorofluoromethane	ug/L	20	19.2	19.0	96	95	75-125	1	30	
Diisopropyl ether	ug/L	20	18.4	18.0	92	90	69-125	2	30	
Ethyl-tert-butyl ether	ug/L	20	19.2	18.7	96	94	73-125	3	30	
Ethylbenzene	ug/L	20	20.3	19.9	102	100	75-125	2	30	
Hexachloro-1,3-butadiene	ug/L	20	19.1	20.4	95	102	75-131	7	30	
Isopropylbenzene (Cumene)	ug/L	20	19.8	19.8	99	99	75-125	0	30	
m&p-Xylene	ug/L	40	41.3	40.2	103	101	75-125	3	30	
Methyl-tert-butyl ether	ug/L	20	19.3	18.9	97	94	75-125	2	30	
Methylene Chloride	ug/L	20	18.9	18.6	95	93	73-125	2	30	
n-Butylbenzene	ug/L	20	19.4	19.7	97	99	75-125	2	30	
n-Propylbenzene	ug/L	20	21.6	21.1	108	105	75-125	2	30	
Naphthalene	ug/L	20	19.4	20.1	97	100	74-125	3	30	
o-Xylene	ug/L	20	20.0	19.0	100	95	75-125	5	30	
p-Isopropyltoluene	ug/L	20	19.7	19.3	98	97	75-125	2	30	
sec-Butylbenzene	ug/L	20	20.1	20.2	100	101	75-125	1	30	
Styrene	ug/L	20	18.1	18.3	90	92	75-125	1	30	
tert-Amylmethyl ether	ug/L	20	18.7	19.0	94	95	71-126	1	30	
tert-Butyl Alcohol	ug/L	200	227	218	113	109	69-131	4	30	
tert-Butylbenzene	ug/L	20	20.5	20.6	102	103	75-125	0	30	
Tetrachloroethene	ug/L	20	20.6	20.1	103	100	75-125	3	30	
Tetrahydrofuran	ug/L	200	244	246	122	123	65-127	1	30	
Toluene	ug/L	20	19.6	19.1	98	95	75-125	3	30	
trans-1,2-Dichloroethene	ug/L	20	19.6	18.7	98	93	75-125	5	30	
trans-1,3-Dichloropropene	ug/L	20	18.5	19.0	92	95	75-125	3	30	
trans-1,4-Dichloro-2-butene	ug/L	50	49.1	50.9	98	102	30-150	3	30	
Trichloroethene	ug/L	20	20.6	20.2	103	101	75-125	2	30	
Trichlorofluoromethane	ug/L	20	20.9	20.0	105	100	71-140	4	30	
Vinyl acetate	ug/L	20	18.5	18.1	92	90	68-137	2	30	
Vinyl chloride	ug/L	20	19.6	18.8	98	94	70-125	5	30	
Xylene (Total)	ug/L	60	61.3	59.2	102	99	75-125	4	30	
1,2-Dichloroethane-d4 (S)	%				100	99	75-137			
4-Bromofluorobenzene (S)	%				98	99	75-125			
Toluene-d8 (S)	%				101	99	75-125			

MATRIX SPIKE SAMPLE: 2719026		10405436001	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	18.7	93	75-137	
1,1,1-Trichloroethane	ug/L	<0.15	20	18.4	92	75-139	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	19.8	99	60-142	
1,1,2-Trichloroethane	ug/L	<0.22	20	18.7	93	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	19.7	98	62-150	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

MATRIX SPIKE SAMPLE: 2719026		10405436001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	17.7	89	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	18.6	93	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	17.7	88	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20.3	102	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	19.4	97	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	18.2	91	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	18.4	92	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	49.7	99	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	19.2	96	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	18.3	92	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	16.1	81	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	36.6	91	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	16.7	84	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	19.1	95	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	18.7	94	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	18.0	90	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	18.5	92	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	322	80	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	18.3	92	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	17.0	85	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	86.9	87	58-125	
2-Chlorotoluene	ug/L	<0.20	20	18.6	93	65-138	
2-Hexanone	ug/L	<2.5	100	104	104	61-134	
4-Chlorotoluene	ug/L	<0.13	20	19.3	96	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	102	102	61-130	
Acetone	ug/L	26.2	100	151	125	51-140	
Acrolein	ug/L	<4.8	200	239	119	48-150	
Acrylonitrile	ug/L	<4.9	200	184	92	55-134	
Benzene	ug/L	<0.13	20	17.8	89	63-132	
Bromobenzene	ug/L	<0.16	20	19.0	95	67-138	
Bromochloromethane	ug/L	<0.38	20	17.6	88	66-138	
Bromodichloromethane	ug/L	<0.20	20	17.9	89	75-137	
Bromoform	ug/L	<1.0	20	17.4	87	65-129	
Bromomethane	ug/L	<1.5	20	19.9	99	41-150	
Carbon disulfide	ug/L	<0.37	20	16.4	82	72-132	
Carbon tetrachloride	ug/L	<0.20	20	18.9	95	75-150	
Chlorobenzene	ug/L	<0.14	20	18.3	91	73-127	
Chloroethane	ug/L	<0.44	20	20.0	100	74-138	
Chloroform	ug/L	<0.46	20	17.3	87	74-125	
Chloromethane	ug/L	<1.1	20	17.6	88	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	18.7	94	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	15.8	79	66-129	
Dibromochloromethane	ug/L	<0.13	20	18.7	93	75-133	
Dibromomethane	ug/L	<0.50	20	18.2	91	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	20.3	101	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	19.3	97	75-129	
Diisopropyl ether	ug/L	<0.12	20	16.3	82	62-128	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

MATRIX SPIKE SAMPLE: 2719026

Parameter	Units	10405436001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	17.1	86	63-132	
Ethylbenzene	ug/L	<0.14	20	18.8	94	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20.0	100	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	18.4	92	70-136	
m&p-Xylene	ug/L	<0.24	40	37.3	93	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	17.0	85	72-125	
Methylene Chloride	ug/L	<1.2	20	17.0	85	60-132	
n-Butylbenzene	ug/L	<0.13	20	18.5	92	60-150	
n-Propylbenzene	ug/L	<0.12	20	19.4	97	63-142	
Naphthalene	ug/L	<0.42	20	17.9	90	67-125	
o-Xylene	ug/L	<0.11	20	18.5	93	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	17.9	89	64-146	
sec-Butylbenzene	ug/L	<0.12	20	18.7	93	67-144	
Styrene	ug/L	<0.14	20	16.2	81	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	17.0	85	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	202	101	56-146	
tert-Butylbenzene	ug/L	<0.15	20	18.7	94	68-135	
Tetrachloroethene	ug/L	<0.16	20	18.9	95	67-148	
Tetrahydrofuran	ug/L	<4.3	200	251	126	51-141	
Toluene	ug/L	<0.17	20	17.8	89	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	17.8	89	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	16.8	84	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	45.1	90	30-150	
Trichloroethene	ug/L	<0.18	20	18.5	93	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	21.9	110	75-150	
Vinyl acetate	ug/L	<1.5	20	16.1	80	49-143	
Vinyl chloride	ug/L	<0.096	20	20.0	100	75-133	
Xylene (Total)	ug/L	<0.24	60	55.8	93	63-142	
1,2-Dichloroethane-d4 (S)	%				99	75-137	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				100	75-125	

SAMPLE DUPLICATE: 2719029

Parameter	Units	10404438001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

SAMPLE DUPLICATE: 2719029

Parameter	Units	10404438001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	0.48J	0.43J		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	0.48J	0.43J		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

SAMPLE DUPLICATE: 2719029

Parameter	Units	10404438001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	0.73	0.73	0	30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	106	102	4		
4-Bromofluorobenzene (S)	%	104	100	3		
Toluene-d8 (S)	%	101	102	1		

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 500081

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405436

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10405436001	Silva-GW-092917	EPA 8260B	500081		
10405436002	Trip Blank	EPA 8260B	500081		

### REPORT OF LABORATORY ANALYSIS


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**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M Hill Project #: \_\_\_\_\_

**WO#: 10405436**



10405436

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7475-9634

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.2 Cooler Temp Corrected (°C): 3.5 Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: 9-30-17 BC

USDA Regulated Soil ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>All vials have headspace</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>2 Trip Blanks</u>
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>10:00</u>	Temp: <u>3.2</u>	Corrected Temp: <u>3.5</u>
Time: <u>10:05</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNI GROSS

Date: 10/02/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 13, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

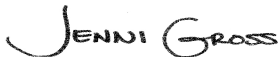
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: UST-078  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: MN00064  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Alaska Certification UST-107  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Montana Certificate #CERT0103  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10405930001	MW21D-GW-100217	Water	10/02/17 11:10	10/04/17 09:45
10405930002	MW16D-GW-100217	Water	10/02/17 12:05	10/04/17 09:45
10405930003	MW18D-GW-100217	Water	10/02/17 13:40	10/04/17 09:45
10405930004	MW15D-GW-100217	Water	10/02/17 14:30	10/04/17 09:45

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10405930001	MW21D-GW-100217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10405930002	MW16D-GW-100217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10405930003	MW18D-GW-100217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10405930004	MW15D-GW-100217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10405930001</b>	<b>MW21D-GW-100217</b>					
RSK 175	Methane	2.5J	ug/L	10.0	10/08/17 14:39	
6010C Met	Barium, Dissolved	84.6	ug/L	10.0	10/05/17 20:29	
6010C Met	Calcium, Dissolved	25500	ug/L	500	10/05/17 20:29	
6010C Met	Iron, Dissolved	257	ug/L	50.0	10/05/17 20:29	
6010C Met	Magnesium, Dissolved	22900	ug/L	500	10/05/17 20:29	
6010C Met	Manganese, Dissolved	137	ug/L	5.0	10/05/17 20:29	
6010C Met	Potassium, Dissolved	4530	ug/L	2500	10/05/17 20:29	
6010C Met	Sodium, Dissolved	25500	ug/L	1000	10/05/17 20:29	
6010C Met	Vanadium, Dissolved	0.44J	ug/L	15.0	10/05/17 20:29	
SM 2320B	Alkalinity, Total as CaCO3	208	mg/L	5.0	10/12/17 13:50	
SM 2540C	Total Dissolved Solids	246	mg/L	10.0	10/09/17 10:27	
SM 4500-S-2 D	Sulfide, Total	0.0067J	mg/L	0.020	10/09/17 16:10	
EPA 300.0	Chloride	3.3	mg/L	1.2	10/05/17 09:45	
EPA 300.0	Sulfate	9.8	mg/L	1.2	10/05/17 09:45	M1
SM 5310C	Total Organic Carbon	0.72J	mg/L	1.0	10/07/17 01:32	
<b>10405930002</b>	<b>MW16D-GW-100217</b>					
6010C Met	Barium, Dissolved	55.1	ug/L	10.0	10/05/17 20:32	
6010C Met	Calcium, Dissolved	58400	ug/L	500	10/05/17 20:32	
6010C Met	Chromium, Dissolved	0.70J	ug/L	10.0	10/05/17 20:32	
6010C Met	Magnesium, Dissolved	17600	ug/L	500	10/05/17 20:32	
6010C Met	Manganese, Dissolved	0.79J	ug/L	5.0	10/05/17 20:32	B
6010C Met	Potassium, Dissolved	1500J	ug/L	2500	10/05/17 20:32	
6010C Met	Sodium, Dissolved	17500	ug/L	1000	10/05/17 20:32	
6010C Met	Vanadium, Dissolved	9.2J	ug/L	15.0	10/05/17 20:32	
SM 2320B	Alkalinity, Total as CaCO3	229	mg/L	5.0	10/12/17 14:20	
SM 2540C	Total Dissolved Solids	339	mg/L	10.0	10/09/17 10:27	
EPA 300.0	Chloride	5.9	mg/L	1.2	10/05/17 10:48	
EPA 300.0	Nitrate as N	5.5	mg/L	0.10	10/05/17 10:48	H1
EPA 300.0	Sulfate	18.0	mg/L	1.2	10/05/17 10:48	
EPA 353.2	Nitrogen, NO2 plus NO3	6.0	mg/L	0.10	10/07/17 17:12	
SM 5310C	Total Organic Carbon	0.73J	mg/L	1.0	10/07/17 02:14	
<b>10405930003</b>	<b>MW18D-GW-100217</b>					
RSK 175	Methane	2.7J	ug/L	10.0	10/09/17 08:18	
6010C Met	Barium, Dissolved	53.9	ug/L	10.0	10/05/17 20:35	
6010C Met	Calcium, Dissolved	22200	ug/L	500	10/05/17 20:35	
6010C Met	Iron, Dissolved	75.6	ug/L	50.0	10/05/17 20:35	
6010C Met	Magnesium, Dissolved	16200	ug/L	500	10/05/17 20:35	
6010C Met	Manganese, Dissolved	57.1	ug/L	5.0	10/05/17 20:35	
6010C Met	Potassium, Dissolved	4050	ug/L	2500	10/05/17 20:35	
6010C Met	Sodium, Dissolved	20000	ug/L	1000	10/05/17 20:35	
SM 2320B	Alkalinity, Total as CaCO3	162	mg/L	5.0	10/12/17 14:25	
SM 2540C	Total Dissolved Solids	203	mg/L	10.0	10/09/17 10:27	
EPA 300.0	Chloride	2.8	mg/L	1.2	10/05/17 11:03	
EPA 300.0	Sulfate	8.4	mg/L	1.2	10/05/17 11:03	
SM 5310C	Total Organic Carbon	0.53J	mg/L	1.0	10/07/17 02:29	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10405930004</b>	<b>MW15D-GW-100217</b>					
RSK 175	Methane	3.1J	ug/L	10.0	10/09/17 08:25	
6010C Met	Barium, Dissolved	10.6	ug/L	10.0	10/05/17 20:38	
6010C Met	Calcium, Dissolved	38600	ug/L	500	10/05/17 20:38	
6010C Met	Copper, Dissolved	2.2J	ug/L	10.0	10/05/17 20:38	
6010C Met	Magnesium, Dissolved	14500	ug/L	500	10/05/17 20:38	
6010C Met	Manganese, Dissolved	1.4J	ug/L	5.0	10/05/17 20:38	B
6010C Met	Potassium, Dissolved	2820	ug/L	2500	10/05/17 20:38	
6010C Met	Sodium, Dissolved	15700	ug/L	1000	10/05/17 20:38	
6010C Met	Vanadium, Dissolved	10J	ug/L	15.0	10/05/17 20:38	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	176	mg/L	5.0	10/12/17 14:29	
SM 2540C	Total Dissolved Solids	250	mg/L	10.0	10/09/17 10:27	
EPA 300.0	Chloride	3.0	mg/L	1.2	10/05/17 11:18	
EPA 300.0	Nitrate as N	1.9	mg/L	0.10	10/05/17 11:18	H1
EPA 300.0	Sulfate	5.9	mg/L	1.2	10/05/17 11:18	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	1.9	mg/L	0.040	10/07/17 17:13	
SM 5310C	Total Organic Carbon	0.48J	mg/L	1.0	10/07/17 03:12	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 500709

B: Analyte was detected in the associated method blank.

- BLANK for HBN 500709 [MPRP/759 (Lab ID: 2722281)
- Manganese, Dissolved

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 500709

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405937005

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 2722283)
- Calcium, Dissolved

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502133

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405930001,10406190001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2729198)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2729199)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

### General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW15D-GW-100217 (Lab ID: 10405930004)
- MW16D-GW-100217 (Lab ID: 10405930002)
- MW18D-GW-100217 (Lab ID: 10405930003)
- MW21D-GW-100217 (Lab ID: 10405930001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 500755

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405930001,10406050001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2722436)
  - Sulfate
- MSD (Lab ID: 2722437)
  - Sulfate

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2723097)
  - Chloride
- MSD (Lab ID: 2723098)
  - Chloride

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 501219

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405055007,10405445001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2725001)
- Nitrogen, NO2 plus NO3

QC Batch: 501220

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406184001,10406184002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2725008)
- Nitrogen, NO2 plus NO3

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

### General Information:

4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 501557

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405922001,10405922002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2726165)
  - Chemical Oxygen Demand

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** October 13, 2017

**General Information:**

4 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

**Sample:** MW21D-GW-100217      **Lab ID:** 10405930001      Collected: 10/02/17 11:10      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/08/17 14:39	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/08/17 14:39	74-85-1	
Methane	2.5J	ug/L	10.0	1.1	1		10/08/17 14:39	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/05/17 08:43	10/05/17 20:29	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/05/17 08:43	10/05/17 20:29	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/05/17 08:43	10/05/17 20:29	7440-38-2	
Barium, Dissolved	84.6	ug/L	10.0	0.22	1	10/05/17 08:43	10/05/17 20:29	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/05/17 08:43	10/05/17 20:29	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/05/17 08:43	10/05/17 20:29	7440-43-9	
Calcium, Dissolved	25500	ug/L	500	24.7	1	10/05/17 08:43	10/05/17 20:29	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/05/17 08:43	10/05/17 20:29	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/05/17 08:43	10/05/17 20:29	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/05/17 08:43	10/05/17 20:29	7440-50-8	
Iron, Dissolved	257	ug/L	50.0	16.7	1	10/05/17 08:43	10/05/17 20:29	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/05/17 08:43	10/05/17 20:29	7439-92-1	
Magnesium, Dissolved	22900	ug/L	500	2.6	1	10/05/17 08:43	10/05/17 20:29	7439-95-4	
Manganese, Dissolved	137	ug/L	5.0	0.38	1	10/05/17 08:43	10/05/17 20:29	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/05/17 08:43	10/05/17 20:29	7440-02-0	
Potassium, Dissolved	4530	ug/L	2500	126	1	10/05/17 08:43	10/05/17 20:29	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/05/17 08:43	10/05/17 20:29	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/05/17 08:43	10/05/17 20:29	7440-22-4	
Sodium, Dissolved	25500	ug/L	1000	44.6	1	10/05/17 08:43	10/05/17 20:29	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/05/17 08:43	10/05/17 20:29	7440-28-0	
Vanadium, Dissolved	0.44J	ug/L	15.0	0.42	1	10/05/17 08:43	10/05/17 20:29	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	10/05/17 08:43	10/05/17 20:29	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/05/17 08:23	10/09/17 17:15	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	208	mg/L	5.0	1.4	1		10/12/17 13:50		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	246	mg/L	10.0	5.0	1		10/09/17 10:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0067J	mg/L	0.020	0.0050	1		10/09/17 16:10	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.3	mg/L	1.2	0.14	1		10/05/17 09:45	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		10/05/17 09:45	14797-55-8	H1
Sulfate	9.8	mg/L	1.2	0.27	1		10/05/17 09:45	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Sample: MW21D-GW-100217**      **Lab ID: 10405930001**      Collected: 10/02/17 11:10      Received: 10/04/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		10/07/17 16:16		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/10/17 10:57	10/10/17 14:14		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.72J</b>	mg/L	1.0	0.20	1		10/07/17 01:32	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

Sample: **MW16D-GW-100217** Lab ID: **10405930002** Collected: 10/02/17 12:05 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/09/17 08:11	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/09/17 08:11	74-85-1	
Methane	<1.1	ug/L	10.0	1.1	1		10/09/17 08:11	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/05/17 08:43	10/05/17 20:32	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/05/17 08:43	10/05/17 20:32	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/05/17 08:43	10/05/17 20:32	7440-38-2	
Barium, Dissolved	55.1	ug/L	10.0	0.22	1	10/05/17 08:43	10/05/17 20:32	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/05/17 08:43	10/05/17 20:32	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/05/17 08:43	10/05/17 20:32	7440-43-9	
Calcium, Dissolved	58400	ug/L	500	24.7	1	10/05/17 08:43	10/05/17 20:32	7440-70-2	
Chromium, Dissolved	0.70J	ug/L	10.0	0.50	1	10/05/17 08:43	10/05/17 20:32	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/05/17 08:43	10/05/17 20:32	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/05/17 08:43	10/05/17 20:32	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/05/17 08:43	10/05/17 20:32	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/05/17 08:43	10/05/17 20:32	7439-92-1	
Magnesium, Dissolved	17600	ug/L	500	2.6	1	10/05/17 08:43	10/05/17 20:32	7439-95-4	
Manganese, Dissolved	0.79J	ug/L	5.0	0.38	1	10/05/17 08:43	10/05/17 20:32	7439-96-5	B
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/05/17 08:43	10/05/17 20:32	7440-02-0	
Potassium, Dissolved	1500J	ug/L	2500	126	1	10/05/17 08:43	10/05/17 20:32	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/05/17 08:43	10/05/17 20:32	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/05/17 08:43	10/05/17 20:32	7440-22-4	
Sodium, Dissolved	17500	ug/L	1000	44.6	1	10/05/17 08:43	10/05/17 20:32	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/05/17 08:43	10/05/17 20:32	7440-28-0	
Vanadium, Dissolved	9.2J	ug/L	15.0	0.42	1	10/05/17 08:43	10/05/17 20:32	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	10/05/17 08:43	10/05/17 20:32	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/05/17 08:23	10/09/17 17:17	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	229	mg/L	5.0	1.4	1		10/12/17 14:20		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	339	mg/L	10.0	5.0	1		10/09/17 10:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/09/17 16:12	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.9	mg/L	1.2	0.14	1		10/05/17 10:48	16887-00-6	
Nitrate as N	5.5	mg/L	0.10	0.0079	1		10/05/17 10:48	14797-55-8	H1
Sulfate	18.0	mg/L	1.2	0.27	1		10/05/17 10:48	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Sample: MW16D-GW-100217**      **Lab ID: 10405930002**      Collected: 10/02/17 12:05      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>6.0</b>	mg/L	0.10	0.037	5		10/07/17 17:12		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/10/17 10:57	10/10/17 14:14		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.73J</b>	mg/L	1.0	0.20	1		10/07/17 02:14	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

**Sample:** MW18D-GW-100217    **Lab ID:** 10405930003    Collected: 10/02/17 13:40    Received: 10/04/17 09:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/09/17 08:18	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/09/17 08:18	74-85-1	
Methane	2.7J	ug/L	10.0	1.1	1		10/09/17 08:18	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/05/17 08:43	10/05/17 20:35	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/05/17 08:43	10/05/17 20:35	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/05/17 08:43	10/05/17 20:35	7440-38-2	
Barium, Dissolved	53.9	ug/L	10.0	0.22	1	10/05/17 08:43	10/05/17 20:35	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/05/17 08:43	10/05/17 20:35	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/05/17 08:43	10/05/17 20:35	7440-43-9	
Calcium, Dissolved	22200	ug/L	500	24.7	1	10/05/17 08:43	10/05/17 20:35	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/05/17 08:43	10/05/17 20:35	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/05/17 08:43	10/05/17 20:35	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/05/17 08:43	10/05/17 20:35	7440-50-8	
Iron, Dissolved	75.6	ug/L	50.0	16.7	1	10/05/17 08:43	10/05/17 20:35	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/05/17 08:43	10/05/17 20:35	7439-92-1	
Magnesium, Dissolved	16200	ug/L	500	2.6	1	10/05/17 08:43	10/05/17 20:35	7439-95-4	
Manganese, Dissolved	57.1	ug/L	5.0	0.38	1	10/05/17 08:43	10/05/17 20:35	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/05/17 08:43	10/05/17 20:35	7440-02-0	
Potassium, Dissolved	4050	ug/L	2500	126	1	10/05/17 08:43	10/05/17 20:35	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/05/17 08:43	10/05/17 20:35	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/05/17 08:43	10/05/17 20:35	7440-22-4	
Sodium, Dissolved	20000	ug/L	1000	44.6	1	10/05/17 08:43	10/05/17 20:35	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/05/17 08:43	10/05/17 20:35	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	10/05/17 08:43	10/05/17 20:35	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	10/05/17 08:43	10/05/17 20:35	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/05/17 08:23	10/09/17 17:19	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	162	mg/L	5.0	1.4	1		10/12/17 14:25		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	203	mg/L	10.0	5.0	1		10/09/17 10:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/09/17 16:13	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.8	mg/L	1.2	0.14	1		10/05/17 11:03	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		10/05/17 11:03	14797-55-8	H1
Sulfate	8.4	mg/L	1.2	0.27	1		10/05/17 11:03	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Sample: MW18D-GW-100217**      **Lab ID: 10405930003**      Collected: 10/02/17 13:40      Received: 10/04/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		10/07/17 16:20		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/10/17 10:57	10/10/17 14:14		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.53J</b>	mg/L	1.0	0.20	1		10/07/17 02:29	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

**Sample: MW15D-GW-100217**      **Lab ID: 10405930004**      Collected: 10/02/17 14:30      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/09/17 08:25	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/09/17 08:25	74-85-1	
Methane	3.1J	ug/L	10.0	1.1	1		10/09/17 08:25	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/05/17 08:43	10/05/17 20:38	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/05/17 08:43	10/05/17 20:38	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/05/17 08:43	10/05/17 20:38	7440-38-2	
Barium, Dissolved	10.6	ug/L	10.0	0.22	1	10/05/17 08:43	10/05/17 20:38	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/05/17 08:43	10/05/17 20:38	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/05/17 08:43	10/05/17 20:38	7440-43-9	
Calcium, Dissolved	38600	ug/L	500	24.7	1	10/05/17 08:43	10/05/17 20:38	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/05/17 08:43	10/05/17 20:38	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/05/17 08:43	10/05/17 20:38	7440-48-4	
Copper, Dissolved	2.2J	ug/L	10.0	0.83	1	10/05/17 08:43	10/05/17 20:38	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/05/17 08:43	10/05/17 20:38	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/05/17 08:43	10/05/17 20:38	7439-92-1	
Magnesium, Dissolved	14500	ug/L	500	2.6	1	10/05/17 08:43	10/05/17 20:38	7439-95-4	
Manganese, Dissolved	1.4J	ug/L	5.0	0.38	1	10/05/17 08:43	10/05/17 20:38	7439-96-5	B
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/05/17 08:43	10/05/17 20:38	7440-02-0	
Potassium, Dissolved	2820	ug/L	2500	126	1	10/05/17 08:43	10/05/17 20:38	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/05/17 08:43	10/05/17 20:38	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/05/17 08:43	10/05/17 20:38	7440-22-4	
Sodium, Dissolved	15700	ug/L	1000	44.6	1	10/05/17 08:43	10/05/17 20:38	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/05/17 08:43	10/05/17 20:38	7440-28-0	
Vanadium, Dissolved	10J	ug/L	15.0	0.42	1	10/05/17 08:43	10/05/17 20:38	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	10/05/17 08:43	10/05/17 20:38	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/05/17 08:23	10/09/17 17:21	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	176	mg/L	5.0	1.4	1		10/12/17 14:29		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	250	mg/L	10.0	5.0	1		10/09/17 10:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/09/17 16:14	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.0	mg/L	1.2	0.14	1		10/05/17 11:18	16887-00-6	
Nitrate as N	1.9	mg/L	0.10	0.0079	1		10/05/17 11:18	14797-55-8	H1
Sulfate	5.9	mg/L	1.2	0.27	1		10/05/17 11:18	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

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**Sample: MW15D-GW-100217**      **Lab ID: 10405930004**      Collected: 10/02/17 14:30      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.9</b>	mg/L	0.040	0.015	2		10/07/17 17:13		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/10/17 10:57	10/10/17 14:14		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.48J</b>	mg/L	1.0	0.20	1		10/07/17 03:12	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

QC Project No.: 10405930

QC Batch: 501230

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10405930001

METHOD BLANK: 2725021

Matrix: Water

Associated Lab Samples: 10405930001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/08/17 11:05	
Ethene	ug/L	<0.68	10.0	0.68	10/08/17 11:05	
Methane	ug/L	1.6J	10.0	1.1	10/08/17 11:05	

LABORATORY CONTROL SAMPLE & LCSD: 2725022

2725023

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	97.6	103	86	90	85-115	5	20	
Ethene	ug/L	106	91.9	96.6	87	91	85-115	5	20	
Methane	ug/L	60.7	51.9	55.3	86	91	85-115	6	20	

SAMPLE DUPLICATE: 2725024

Parameter	Units	1297909002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	54.4	56.8	4	20	
Ethene	ug/L	17.5	18.1	4	20	
Methane	ug/L	4490	4510	0	20	

SAMPLE DUPLICATE: 2725025

Parameter	Units	10405930001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	2.5J	3.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 501231 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10405930002, 10405930003, 10405930004

METHOD BLANK: 2725026 Matrix: Water

Associated Lab Samples: 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/09/17 07:51	
Ethene	ug/L	<0.68	10.0	0.68	10/09/17 07:51	
Methane	ug/L	1.5J	10.0	1.1	10/09/17 07:51	

LABORATORY CONTROL SAMPLE & LCSD: 2725027

2725028

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	109	109	96	96	85-115	0	20	
Ethene	ug/L	106	102	102	96	96	85-115	0	20	
Methane	ug/L	60.7	57.2	57.7	94	95	85-115	1	20	

SAMPLE DUPLICATE: 2725031

Parameter	Units	10406354003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	<1.1	1.1J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 500719

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 2722324

Matrix: Water

Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	10/09/17 16:48	

LABORATORY CONTROL SAMPLE: 2722325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.6	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2722326 2722327

Parameter	Units	10405937006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	ND	5	5	5.2	5.1	103	102	80-120	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 500709 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 2722281 Matrix: Water  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	10/05/17 19:55	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	10/05/17 19:55	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	10/05/17 19:55	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	10/05/17 19:55	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	10/05/17 19:55	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	10/05/17 19:55	
Calcium, Dissolved	ug/L	<24.7	500	24.7	10/05/17 19:55	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	10/05/17 19:55	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	10/05/17 19:55	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	10/05/17 19:55	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	10/05/17 19:55	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	10/05/17 19:55	
Magnesium, Dissolved	ug/L	5.9J	500	2.6	10/05/17 19:55	
Manganese, Dissolved	ug/L	0.48J	5.0	0.38	10/05/17 19:55	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	10/05/17 19:55	
Potassium, Dissolved	ug/L	<126	2500	126	10/05/17 19:55	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	10/05/17 19:55	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	10/05/17 19:55	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	10/05/17 19:55	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	10/05/17 19:55	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	10/05/17 19:55	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	10/05/17 19:55	

LABORATORY CONTROL SAMPLE: 2722282

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20700	103	80-120	
Antimony, Dissolved	ug/L	1000	1030	103	80-120	
Arsenic, Dissolved	ug/L	1000	1010	101	80-120	
Barium, Dissolved	ug/L	1000	1040	104	80-120	
Beryllium, Dissolved	ug/L	1000	1030	103	80-120	
Cadmium, Dissolved	ug/L	1000	1020	102	80-120	
Calcium, Dissolved	ug/L	20000	19900	100	80-120	
Chromium, Dissolved	ug/L	1000	1020	102	80-120	
Cobalt, Dissolved	ug/L	1000	1020	102	80-120	
Copper, Dissolved	ug/L	1000	989	99	80-120	
Iron, Dissolved	ug/L	20000	20400	102	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20300	101	80-120	
Manganese, Dissolved	ug/L	1000	1030	103	80-120	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

LABORATORY CONTROL SAMPLE: 2722282

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1030	103	80-120	
Potassium, Dissolved	ug/L	20000	20000	100	80-120	
Selenium, Dissolved	ug/L	1000	1050	105	80-120	
Silver, Dissolved	ug/L	500	499	100	80-120	
Sodium, Dissolved	ug/L	20000	20000	100	80-120	
Thallium, Dissolved	ug/L	1000	1030	103	80-120	
Vanadium, Dissolved	ug/L	1000	991	99	80-120	
Zinc, Dissolved	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2722283 2722284

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10405937005 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	22100	22000	110	110	75-125	0	20
Antimony, Dissolved	ug/L	ND	1000	1000	1090	1060	109	106	75-125	2	20
Arsenic, Dissolved	ug/L	ND	1000	1000	1080	1080	108	108	75-125	0	20
Barium, Dissolved	ug/L	139	1000	1000	1170	1160	103	102	75-125	0	20
Beryllium, Dissolved	ug/L	ND	1000	1000	1080	1080	108	108	75-125	0	20
Cadmium, Dissolved	ug/L	ND	1000	1000	1060	1060	106	106	75-125	0	20
Calcium, Dissolved	ug/L	251000	20000	20000	278000	274000	136	119	75-125	1	20 P6
Chromium, Dissolved	ug/L	ND	1000	1000	1020	1020	102	102	75-125	0	20
Cobalt, Dissolved	ug/L	18.1	1000	1000	1010	1010	99	99	75-125	0	20
Copper, Dissolved	ug/L	ND	1000	1000	1040	1040	104	103	75-125	0	20
Iron, Dissolved	ug/L	2210	20000	20000	22400	22400	101	101	75-125	0	20
Lead, Dissolved	ug/L	ND	1000	1000	997	996	100	99	75-125	0	20
Magnesium, Dissolved	ug/L	91100	20000	20000	115000	113000	117	111	75-125	1	20
Manganese, Dissolved	ug/L	1610	1000	1000	2670	2640	106	104	75-125	1	20
Nickel, Dissolved	ug/L	25.2	1000	1000	1010	1010	99	98	75-125	0	20
Potassium, Dissolved	ug/L	22600	20000	20000	46100	45700	118	116	75-125	1	20
Selenium, Dissolved	ug/L	ND	1000	1000	1100	1100	109	109	75-125	0	20
Silver, Dissolved	ug/L	ND	500	500	524	524	105	105	75-125	0	20
Sodium, Dissolved	ug/L	219000	20000	20000	242000	240000	117	104	75-125	1	20
Thallium, Dissolved	ug/L	ND	1000	1000	969	972	96	97	75-125	0	20
Vanadium, Dissolved	ug/L	ND	1000	1000	1010	1010	101	101	75-125	0	20
Zinc, Dissolved	ug/L	ND	1000	1000	988	984	98	98	75-125	0	20

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

QC Batch: 502133 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 2729193 Matrix: Water  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	10/12/17 12:54	

LABORATORY CONTROL SAMPLE & LCSD: 2729194 2729195

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.6	40.9	104	102	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729196 2729197

Parameter	Units	10405930001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	208	40	40	255	256	118	120	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729198 2729199

Parameter	Units	10406190001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	322	40	40	315	378	-16	142	80-120	18	30	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 501034

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 2723739

Matrix: Water

Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/09/17 10:27	

LABORATORY CONTROL SAMPLE: 2723740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 2723741

Parameter	Units	10405964001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	757	737	3	10	

SAMPLE DUPLICATE: 2725208

Parameter	Units	10406354001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	239	247	3	10	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 91336 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 392591 Matrix: Water  
 Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	10/09/17 16:07	

LABORATORY CONTROL SAMPLE: 392592

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	95	90-110	

MATRIX SPIKE SAMPLE: 392594

Parameter	Units	10405930001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	0.0067J	.2	0.17	81	75-125	

SAMPLE DUPLICATE: 392593

Parameter	Units	10405930001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	0.0067J	0.0063J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

QC Batch: 500755 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 2722434 Matrix: Water  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	10/05/17 09:06	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	10/05/17 09:06	
Sulfate	mg/L	<0.27	1.2	0.27	10/05/17 09:06	

LABORATORY CONTROL SAMPLE: 2722435

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	
Nitrate as N	mg/L	1	0.95	95	90-110	
Sulfate	mg/L	12.5	11.9	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2722436 2722437

Parameter	Units	10405930001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	3.3	12.5	12.5	15.2	15.2	95	95	90-110	0	20		
Nitrate as N	mg/L	<0.0079	1	1	0.93	0.93	93	93	90-110	0	20		
Sulfate	mg/L	9.8	12.5	12.5	20.7	20.8	87	88	90-110	0	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2723097 2723098

Parameter	Units	10406050001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	203	125	125	313	313	88	88	90-110	0	20	M6	
Nitrate as N	mg/L	0.34	1	1	1.3	1.3	94	94	90-110	0	20		
Sulfate	mg/L	162	125	125	274	274	90	90	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 501219

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10405930001

METHOD BLANK: 2724999

Matrix: Water

Associated Lab Samples: 10405930001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/07/17 16:17	FS

LABORATORY CONTROL SAMPLE: 2725000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725001 2725002

Parameter	Units	10405055007		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Nitrogen, NO2 plus NO3	mg/L	6.6	10	10	13.9	16.2	73	96	90-110	15	20	M6	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725003 2725004

Parameter	Units	10405445001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.94	0.95	93	94	90-110	1	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 501220 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10405930002, 10405930003, 10405930004

METHOD BLANK: 2725005 Matrix: Water

Associated Lab Samples: 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/07/17 16:53	FS

LABORATORY CONTROL SAMPLE: 2725006

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725007 2725008

Parameter	Units	10406184001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.94	0.89	92	87	90-110	5	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725009 2725010

Parameter	Units	10406184002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Nitrogen, NO2 plus NO3	mg/L	0.088	1	1	1.0	1.0	91	94	90-110	3	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

QC Batch: 501557 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 2726161 Matrix: Water  
Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	10/10/17 14:09	

LABORATORY CONTROL SAMPLE: 2726162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	300	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2726163 2726164

Parameter	Units	10405922001		2726163		2726164		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	3800	2500	2500	6070	6180	91	95	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2726165 2726166

Parameter	Units	10405922002		2726165		2726166		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	3340	2500	2500	6100	5940	111	104	90-110	3	20 M1	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10405930

QC Batch: 127802 Analysis Method: SM 5310C

QC Batch Method: SM 5310C Analysis Description: 5310C TOC

Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

METHOD BLANK: 508366 Matrix: Water

Associated Lab Samples: 10405930001, 10405930002, 10405930003, 10405930004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/06/17 21:31	

LABORATORY CONTROL SAMPLE: 508367

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.4	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 508368 508369

Parameter	Units	508368		508369		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10405582031 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	2.9	25	25	28.0	28.0	101	101	80-120	0	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 508370 508371

Parameter	Units	508370		508371		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10405930001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.72J	25	25	25.2	25.2	98	98	80-120	0	20

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis  
PASI-N Pace Analytical Services - New Orleans  
PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.  
FS The sample was filtered in the laboratory prior to analysis.  
H1 Analysis conducted outside the recognized method holding time.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.  
P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10405930

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10405930001	MW21D-GW-100217	RSK 175	501230		
10405930002	MW16D-GW-100217	RSK 175	501231		
10405930003	MW18D-GW-100217	RSK 175	501231		
10405930004	MW15D-GW-100217	RSK 175	501231		
10405930001	MW21D-GW-100217	EPA 3010	500709	6010C Met	500851
10405930002	MW16D-GW-100217	EPA 3010	500709	6010C Met	500851
10405930003	MW18D-GW-100217	EPA 3010	500709	6010C Met	500851
10405930004	MW15D-GW-100217	EPA 3010	500709	6010C Met	500851
10405930001	MW21D-GW-100217	EPA 7470A	500719	EPA 7470A	500918
10405930002	MW16D-GW-100217	EPA 7470A	500719	EPA 7470A	500918
10405930003	MW18D-GW-100217	EPA 7470A	500719	EPA 7470A	500918
10405930004	MW15D-GW-100217	EPA 7470A	500719	EPA 7470A	500918
10405930001	MW21D-GW-100217	SM 2320B	502133		
10405930002	MW16D-GW-100217	SM 2320B	502133		
10405930003	MW18D-GW-100217	SM 2320B	502133		
10405930004	MW15D-GW-100217	SM 2320B	502133		
10405930001	MW21D-GW-100217	SM 2540C	501034		
10405930002	MW16D-GW-100217	SM 2540C	501034		
10405930003	MW18D-GW-100217	SM 2540C	501034		
10405930004	MW15D-GW-100217	SM 2540C	501034		
10405930001	MW21D-GW-100217	SM 4500-S-2 D	91336		
10405930002	MW16D-GW-100217	SM 4500-S-2 D	91336		
10405930003	MW18D-GW-100217	SM 4500-S-2 D	91336		
10405930004	MW15D-GW-100217	SM 4500-S-2 D	91336		
10405930001	MW21D-GW-100217	EPA 300.0	500755		
10405930002	MW16D-GW-100217	EPA 300.0	500755		
10405930003	MW18D-GW-100217	EPA 300.0	500755		
10405930004	MW15D-GW-100217	EPA 300.0	500755		
10405930001	MW21D-GW-100217	EPA 353.2	501219		
10405930002	MW16D-GW-100217	EPA 353.2	501220		
10405930003	MW18D-GW-100217	EPA 353.2	501220		
10405930004	MW15D-GW-100217	EPA 353.2	501220		
10405930001	MW21D-GW-100217	EPA 410.4	501557	EPA 410.4	501703
10405930002	MW16D-GW-100217	EPA 410.4	501557	EPA 410.4	501703
10405930003	MW18D-GW-100217	EPA 410.4	501557	EPA 410.4	501703
10405930004	MW15D-GW-100217	EPA 410.4	501557	EPA 410.4	501703
10405930001	MW21D-GW-100217	SM 5310C	127802		
10405930002	MW16D-GW-100217	SM 5310C	127802		
10405930003	MW18D-GW-100217	SM 5310C	127802		
10405930004	MW15D-GW-100217	SM 5310C	127802		

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
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## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10405930

**Section A**

Required Client Information:

**Section B**

Required Project Information:

**Section C**

Invoice Information:

Page : 1 / Of 1

Company: CH2M Hill	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Walsh
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	Copy To: Steve Demus, Lindsey Baumann	Company: UPRR
Email:	Copy To: David Hodson, UPRR-Sysdat@ghd.com	Address: 1400 W. 52nd Ave, Denver, CO 80221
Phone:	Purchase Order # PEDD# 1497	Pace Quote: Contract# 758938
Requested Due Date: <b>10 Day Standard</b>	Project Name: Freeman WA-Grain Handling Facility	Pace Project Manager: Jennifer Gross
Fax:	Project #: 1497	Pace Profile #: 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see, valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					Analyses Test Y/N	Y	Requested Analysis Filtered (Y/N)													MS/MSD Requested												
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate			Other	Low Level VOCs by 8260	6010/1470 TAL Dissolved Metals *	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2															
				DATE	TIME	DATE	TIME																																			
1	MW210-GW-100217	WT		10/3/17	11:10			8	4	2	1	1																														001
2	MW160-GW-100217				12:05			8	4	2	1	1																													002	
3	MW180-GW-100217				13:40			8	4	2	1	1																													003	
4	MW150-GW-100217				14:30			8	4	2	1	1																													004	
5																																										
6																																										
7																																										
8																																										
9																																										
10																																										
11																																										
12																																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
---------------------	-------------------------------	------	------	---------------------------	------	------	-------------------

Short hold analyses are in <b>bold</b>				ALL - PACE 10-4-17	9/15 3:41	Y	Y Y Y
*Field filtered by client							

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Steve Demus						
SIGNATURE of SAMPLER:	DATE Signed: 10-2-17					



Document Name:  
**Sample Condition Upon Receipt Form**

Document No.:  
**F-MN-L-213-rev.21**

Document Revised: 30Aug2017  
Page 1 of 2

Issuing Authority:  
Pace Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: CH2M Hill Project #: **WO# : 10405930**



10405930

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7222 2739 8665

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB Temp Blank?  Yes  No

Thermometer  151401163 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Used:  G87A9155100842

Cooler Temp Read (°C): 3.6 Cooler Temp Corrected (°C): 3.4 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 0.2 Date and Initials of Person Examining Contents: gk 10-4-17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>gk 10-4-17</u>	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-4: 1, 4</u>
Headspace in VOA Vials (>6mm)? <u>gk 10-4-17</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>1/2 trip blank VOA 7 Comm, 1/2 VOA no headspace</u>
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): <u>HA7230010</u>		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Project Manager Review: JENNI GROSS

Date: 10/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

# Chain of Custody

WO#: 2062846



Analytical®  
www.pacelabs.com

Workorder: 10405930

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 10/4/2017

Results Due: 10/18/2017

Report To		Subcontract To				Requested Analysis																								
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333				<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">5636267 / 4500 Sulfide</div> <div style="border: 1px solid black; width: 100%; height: 100%;"></div> </div>																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													Preserved Containers					LAB USE ONLY							
																		Other												
1	MW21D-GW-100217	PS	10/2/2017 11:10	10405930001	Water													1												
2	MW16D-GW-100217	PS	10/2/2017 12:05	10405930002	Water													1												
3	MW18D-GW-100217	PS	10/2/2017 13:40	10405930003	Water	1																								
4	MW15D-GW-100217	PS	10/2/2017 14:30	10405930004	Water	1																								
5																														
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																								
1		<i>[Signature]</i> Pace MN	10/5/17 1445	<i>[Signature]</i>		0900																								
2		<i>[Signature]</i>	10-6-17	<i>[Signature]</i>	10-6-17																									
3																														
Cooler Temperature on Receipt		1.9°C		Custody Seal	<input checked="" type="checkbox"/> or N	Received on Ice	<input checked="" type="checkbox"/> or N	Samples Intact											<input checked="" type="checkbox"/> or N											

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.





1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Receipt

Proj **WO# : 2062846**

Due Date: 10/18/17

Courier:  Pace Courier  Hired Courier  Fed X  UPS

PM: CMM

CLIENT: PASI-MINN

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10/7/17 JWB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

## WO#: 1298271

PM: HRZ Due Date: 10/20/17  
 CLIENT: PACE MPLS

Workorder: 10405930 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 10/4/2017 Results Requested By: 10/18/2017

Report To		Subcontract To						Requested Analysis											
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										LAB USE ONLY			
						H2SO4													
1	MW21D-GW-100217	PS	10/2/2017 11:10	10405930001	Water	1													
2	MW16D-GW-100217	PS	10/2/2017 12:05	10405930002	Water	1													
3	MW18D-GW-100217	PS	10/2/2017 13:40	10405930003	Water	1													
4	MW15D-GW-100217	PS	10/2/2017 14:30	10405930004	Water	1													
5																			
										Comments									
Transfers		Released By		Date/Time		Received By		Date/Time											
1		<i>[Signature]</i> Pace MN		10/5/17 1445		<i>[Signature]</i>		10/5/17 1830											
2		<i>[Signature]</i>		10/5/17 2240		<i>[Signature]</i>		10/6/17 07:30											
3																			
Cooler Temperature on Receipt 1.7 °C				Custody Seal <input checked="" type="checkbox"/> or N				Received on Ice <input checked="" type="checkbox"/> or N				Samples Intact <input checked="" type="checkbox"/> or N							

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace-MN Project #: \_\_\_\_\_

**WO# : 1298271**  
 PM: HRZ Due Date: 10/20/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: W2pac Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.4 Cooler Temp Corrected °C: 1.7 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 46.3 Date and Initials of Person Examining Contents: JDK 10/17/17

Comments: \_\_\_\_\_

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>Wt</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 10-6-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 11, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman,WA-Cenex Harvest Lease-Revised Report  
Pace Project No.: 10405934

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on December 11, 2017 to populate the quality control data.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10405934001	MW21D-GW-100217	Water	10/02/17 11:10	10/04/17 09:45
10405934002	MW16D-GW-100217	Water	10/02/17 12:05	10/04/17 09:45
10405934003	MW18D-GW-100217	Water	10/02/17 13:40	10/04/17 09:45
10405934004	MW15D-GW-100217	Water	10/02/17 14:30	10/04/17 09:45
10405934005	Trip Blank	Water	10/02/17 00:00	10/04/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease-Revised Report  
Pace Project No.: 10405934

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10405934001	MW21D-GW-100217	EPA 8260B	DJB	83	PASI-M
10405934002	MW16D-GW-100217	EPA 8260B	DJB	83	PASI-M
10405934003	MW18D-GW-100217	EPA 8260B	DJB	83	PASI-M
10405934004	MW15D-GW-100217	EPA 8260B	DJB	83	PASI-M
10405934005	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10405934001</b>	<b>MW21D-GW-100217</b>					
EPA 8260B	Acetone	28.6	ug/L	20.0	10/13/17 06:12	L1
<b>10405934002</b>	<b>MW16D-GW-100217</b>					
EPA 8260B	Acetone	29.4	ug/L	20.0	10/13/17 06:35	L1
<b>10405934003</b>	<b>MW18D-GW-100217</b>					
EPA 8260B	Acetone	58.0	ug/L	20.0	10/13/17 06:59	L1
<b>10405934004</b>	<b>MW15D-GW-100217</b>					
EPA 8260B	Acetone	22.4	ug/L	20.0	10/13/17 07:22	L1
EPA 8260B	Carbon tetrachloride	9.7	ug/L	0.50	10/13/17 07:22	
EPA 8260B	Chloroform	0.56J	ug/L	1.0	10/13/17 07:22	

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 11, 2017

### General Information:

5 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 502264

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2729848)
- Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2729848)
- Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502264

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405951002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2729849)
- Acetone
- Tetrahydrofuran
- MSD (Lab ID: 2729850)

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 11, 2017

QC Batch: 502264

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405951002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- Acetone
- Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: MW21D-GW-100217 Lab ID: 10405934001 Collected: 10/02/17 11:10 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 06:12	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 06:12	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 06:12	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 06:12	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:12	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:12	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 06:12	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:12	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 06:12	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 06:12	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 06:12	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 06:12	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 06:12	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 06:12	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 06:12	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:12	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:12	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 06:12	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 06:12	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 06:12	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 06:12	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 06:12	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 06:12	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 06:12	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 06:12	108-10-1	
Acetone	28.6	ug/L	20.0	8.8	1		10/13/17 06:12	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 06:12	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 06:12	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:12	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 06:12	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 06:12	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 06:12	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 06:12	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 06:12	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/13/17 06:12	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 06:12	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/13/17 06:12	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 06:12	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

**Sample: MW21D-GW-100217**      **Lab ID: 10405934001**      Collected: 10/02/17 11:10      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 06:12	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 06:12	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 06:12	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 06:12	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 06:12	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 06:12	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 06:12	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 06:12	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:12	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 06:12	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 06:12	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 06:12	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 06:12	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 06:12	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 06:12	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 06:12	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:12	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 06:12	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:12	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:12	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 06:12	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 06:12	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:12	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 06:12	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 06:12	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 06:12	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 06:12	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:12	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 06:12	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	113	%	75-137		1		10/13/17 06:12	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/13/17 06:12	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		10/13/17 06:12	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: MW16D-GW-100217 Lab ID: 10405934002 Collected: 10/02/17 12:05 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 06:35	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 06:35	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 06:35	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 06:35	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:35	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:35	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 06:35	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:35	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 06:35	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 06:35	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 06:35	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 06:35	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 06:35	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 06:35	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 06:35	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:35	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:35	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 06:35	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 06:35	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 06:35	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 06:35	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 06:35	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 06:35	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 06:35	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 06:35	108-10-1	
Acetone	29.4	ug/L	20.0	8.8	1		10/13/17 06:35	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 06:35	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 06:35	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:35	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 06:35	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 06:35	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 06:35	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 06:35	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 06:35	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/13/17 06:35	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 06:35	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/13/17 06:35	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 06:35	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: MW16D-GW-100217 Lab ID: 10405934002 Collected: 10/02/17 12:05 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 06:35	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 06:35	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 06:35	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 06:35	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 06:35	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 06:35	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 06:35	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 06:35	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:35	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 06:35	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 06:35	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 06:35	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 06:35	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 06:35	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 06:35	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 06:35	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:35	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 06:35	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:35	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:35	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 06:35	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 06:35	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:35	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 06:35	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 06:35	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 06:35	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 06:35	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:35	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 06:35	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	111	%	75-137		1		10/13/17 06:35	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/13/17 06:35	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		10/13/17 06:35	460-00-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: MW18D-GW-100217 Lab ID: 10405934003 Collected: 10/02/17 13:40 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 06:59	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 06:59	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 06:59	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 06:59	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:59	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:59	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 06:59	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:59	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 06:59	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 06:59	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 06:59	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 06:59	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 06:59	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 06:59	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 06:59	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 06:59	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:59	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 06:59	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 06:59	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 06:59	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 06:59	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 06:59	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 06:59	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 06:59	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 06:59	108-10-1	
Acetone	58.0	ug/L	20.0	8.8	1		10/13/17 06:59	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 06:59	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 06:59	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:59	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 06:59	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 06:59	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 06:59	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 06:59	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 06:59	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/13/17 06:59	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 06:59	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/13/17 06:59	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 06:59	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: MW18D-GW-100217 Lab ID: 10405934003 Collected: 10/02/17 13:40 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 06:59	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 06:59	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 06:59	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 06:59	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 06:59	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 06:59	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 06:59	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 06:59	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 06:59	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 06:59	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 06:59	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 06:59	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 06:59	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 06:59	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 06:59	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 06:59	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:59	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 06:59	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 06:59	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:59	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 06:59	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 06:59	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 06:59	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 06:59	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 06:59	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 06:59	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 06:59	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 06:59	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 06:59	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		10/13/17 06:59	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/13/17 06:59	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		10/13/17 06:59	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: **MW15D-GW-100217** Lab ID: **10405934004** Collected: 10/02/17 14:30 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 07:22	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 07:22	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 07:22	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 07:22	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:22	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:22	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 07:22	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:22	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 07:22	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 07:22	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 07:22	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 07:22	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 07:22	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 07:22	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 07:22	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:22	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 07:22	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 07:22	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 07:22	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 07:22	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 07:22	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 07:22	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 07:22	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 07:22	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 07:22	108-10-1	
Acetone	22.4	ug/L	20.0	8.8	1		10/13/17 07:22	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 07:22	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 07:22	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 07:22	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 07:22	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 07:22	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 07:22	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 07:22	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 07:22	75-15-0	
Carbon tetrachloride	9.7	ug/L	0.50	0.20	1		10/13/17 07:22	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 07:22	75-00-3	
Chloroform	0.56J	ug/L	1.0	0.46	1		10/13/17 07:22	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 07:22	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Sample: MW15D-GW-100217 Lab ID: 10405934004 Collected: 10/02/17 14:30 Received: 10/04/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 07:22	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 07:22	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 07:22	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 07:22	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 07:22	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 07:22	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 07:22	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 07:22	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 07:22	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 07:22	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 07:22	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 07:22	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 07:22	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 07:22	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 07:22	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 07:22	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 07:22	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 07:22	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 07:22	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 07:22	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 07:22	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 07:22	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 07:22	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 07:22	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 07:22	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 07:22	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 07:22	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:22	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 07:22	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	112	%	75-137		1		10/13/17 07:22	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/13/17 07:22	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/13/17 07:22	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

**Sample: Trip Blank**      **Lab ID: 10405934005**      Collected: 10/02/17 00:00      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 01:07	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 01:07	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 01:07	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 01:07	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 01:07	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 01:07	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 01:07	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 01:07	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 01:07	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 01:07	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 01:07	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 01:07	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 01:07	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 01:07	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 01:07	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 01:07	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 01:07	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 01:07	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 01:07	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 01:07	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 01:07	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 01:07	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 01:07	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 01:07	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 01:07	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		10/13/17 01:07	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 01:07	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 01:07	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 01:07	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 01:07	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 01:07	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 01:07	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 01:07	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 01:07	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/13/17 01:07	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 01:07	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/13/17 01:07	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 01:07	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

**Sample:** Trip Blank      **Lab ID:** 10405934005      Collected: 10/02/17 00:00      Received: 10/04/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 01:07	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 01:07	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 01:07	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 01:07	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 01:07	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 01:07	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 01:07	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 01:07	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 01:07	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 01:07	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 01:07	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 01:07	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 01:07	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 01:07	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 01:07	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 01:07	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 01:07	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 01:07	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 01:07	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 01:07	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 01:07	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 01:07	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 01:07	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 01:07	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 01:07	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 01:07	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 01:07	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 01:07	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 01:07	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		10/13/17 01:07	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/13/17 01:07	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		10/13/17 01:07	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

QC Batch: 502264 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10405934001, 10405934002, 10405934003, 10405934004, 10405934005

METHOD BLANK: 2729847 Matrix: Water  
Associated Lab Samples: 10405934001, 10405934002, 10405934003, 10405934004, 10405934005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/13/17 00:44	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/13/17 00:44	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/13/17 00:44	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/13/17 00:44	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/13/17 00:44	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	10/13/17 00:44	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/13/17 00:44	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/13/17 00:44	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/13/17 00:44	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/13/17 00:44	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/13/17 00:44	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/13/17 00:44	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/13/17 00:44	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/13/17 00:44	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/13/17 00:44	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/13/17 00:44	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/13/17 00:44	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/13/17 00:44	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/13/17 00:44	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/13/17 00:44	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/13/17 00:44	
Acetone	ug/L	<8.8	20.0	8.8	10/13/17 00:44	
Acrolein	ug/L	<4.8	10.0	4.8	10/13/17 00:44	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/13/17 00:44	
Benzene	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/13/17 00:44	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/13/17 00:44	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/13/17 00:44	
Bromoform	ug/L	<1.0	4.0	1.0	10/13/17 00:44	
Bromomethane	ug/L	<1.5	4.0	1.5	10/13/17 00:44	
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/13/17 00:44	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/13/17 00:44	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

METHOD BLANK: 2729847

Matrix: Water

Associated Lab Samples: 10405934001, 10405934002, 10405934003, 10405934004, 10405934005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
Chloroethane	ug/L	<0.44	1.0	0.44	10/13/17 00:44	
Chloroform	ug/L	<0.46	1.0	0.46	10/13/17 00:44	
Chloromethane	ug/L	<1.1	4.0	1.1	10/13/17 00:44	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/13/17 00:44	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/13/17 00:44	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/13/17 00:44	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/13/17 00:44	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/13/17 00:44	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/13/17 00:44	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/13/17 00:44	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/13/17 00:44	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
Naphthalene	ug/L	<0.42	1.0	0.42	10/13/17 00:44	
o-Xylene	ug/L	<0.11	0.50	0.11	10/13/17 00:44	
p-Isopropyltoluene	ug/L	<0.14	1.0	0.14	10/13/17 00:44	MN
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
Styrene	ug/L	<0.14	1.0	0.14	10/13/17 00:44	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/13/17 00:44	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/13/17 00:44	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/13/17 00:44	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/13/17 00:44	
Toluene	ug/L	<0.17	0.50	0.17	10/13/17 00:44	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/13/17 00:44	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/13/17 00:44	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/13/17 00:44	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/13/17 00:44	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/13/17 00:44	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/13/17 00:44	
1,2-Dichloroethane-d4 (S)	%	104	75-137		10/13/17 00:44	
4-Bromofluorobenzene (S)	%	101	75-125		10/13/17 00:44	
Toluene-d8 (S)	%	102	75-125		10/13/17 00:44	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

LABORATORY CONTROL SAMPLE: 2729848

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.3	101	75-136	
1,1,1-Trichloroethane	ug/L	20	20.3	102	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	21.5	107	71-138	
1,1,2-Trichloroethane	ug/L	20	20.2	101	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.0	95	69-126	
1,1-Dichloroethane	ug/L	20	19.8	99	75-125	
1,1-Dichloroethene	ug/L	20	19.3	97	75-125	
1,1-Dichloropropene	ug/L	20	20.0	100	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.5	102	75-125	
1,2,3-Trichloropropane	ug/L	20	20.9	105	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.4	97	75-125	
1,2,4-Trimethylbenzene	ug/L	20	18.8	94	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	52.6	105	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	22.3	112	75-125	
1,2-Dichlorobenzene	ug/L	20	20.8	104	75-125	
1,2-Dichloroethane	ug/L	20	18.1	91	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.8	95	75-125	
1,2-Dichloropropane	ug/L	20	20.3	102	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3-Dichlorobenzene	ug/L	20	19.0	95	75-125	
1,3-Dichloropropane	ug/L	20	21.6	108	75-125	
1,4-Dichlorobenzene	ug/L	20	20.2	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	368	92	64-140	
2,2,4-Trimethylpentane	ug/L	20	17.6	88	68-125	
2,2-Dichloropropane	ug/L	20	18.5	92	70-131	
2-Butanone (MEK)	ug/L	100	103	103	69-125	
2-Chlorotoluene	ug/L	20	20.0	100	75-125	
2-Hexanone	ug/L	100	118	118	73-129	
4-Chlorotoluene	ug/L	20	20.6	103	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	115	115	73-125	
Acetone	ug/L	100	136	136	66-126 L1	
Acrolein	ug/L	200	199	99	56-150	
Acrylonitrile	ug/L	200	203	102	68-129	
Benzene	ug/L	20	20.4	102	75-125	
Bromobenzene	ug/L	20	20.3	102	75-125	
Bromochloromethane	ug/L	20	19.9	99	75-126	
Bromodichloromethane	ug/L	20	20.1	101	75-133	
Bromoform	ug/L	20	18.9	94	62-142	
Bromomethane	ug/L	20	17.4	87	34-143	
Carbon disulfide	ug/L	20	18.4	92	71-125	
Carbon tetrachloride	ug/L	20	19.8	99	71-145	
Chlorobenzene	ug/L	20	21.4	107	75-125	
Chloroethane	ug/L	20	17.8	89	75-125	
Chloroform	ug/L	20	18.3	92	75-125	
Chloromethane	ug/L	20	19.0	95	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.7	93	75-125	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

LABORATORY CONTROL SAMPLE: 2729848

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	20.6	103	74-141	
Dibromomethane	ug/L	20	20.5	103	75-125	
Dichlorodifluoromethane	ug/L	20	18.7	93	59-130	
Dichlorofluoromethane	ug/L	20	19.2	96	75-125	
Diisopropyl ether	ug/L	20	18.5	93	69-125	
Ethyl-tert-butyl ether	ug/L	20	19.2	96	73-125	
Ethylbenzene	ug/L	20	21.0	105	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.6	108	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.7	98	75-125	
m&p-Xylene	ug/L	40	39.6	99	75-125	
Methyl-tert-butyl ether	ug/L	20	18.4	92	75-125	
Methylene Chloride	ug/L	20	17.7	89	73-125	
n-Butylbenzene	ug/L	20	19.6	98	75-125	
n-Propylbenzene	ug/L	20	20.8	104	75-125	
Naphthalene	ug/L	20	19.1	95	74-125	
o-Xylene	ug/L	20	21.0	105	75-125	
p-Isopropyltoluene	ug/L	20	19.1	95	75-125	
sec-Butylbenzene	ug/L	20	19.5	97	75-125	
Styrene	ug/L	20	19.4	97	75-125	
tert-Amylmethyl ether	ug/L	20	19.5	98	71-126	
tert-Butyl Alcohol	ug/L	200	195	98	69-131	
tert-Butylbenzene	ug/L	20	20.5	102	75-125	
Tetrachloroethene	ug/L	20	21.9	110	75-125	
Tetrahydrofuran	ug/L	200	265	133	65-127 L3	
Toluene	ug/L	20	19.5	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.5	98	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	46.8	94	30-150	
Trichloroethene	ug/L	20	20.1	100	75-125	
Trichlorofluoromethane	ug/L	20	19.2	96	71-140	
Vinyl acetate	ug/L	20	18.6	93	68-137	
Vinyl chloride	ug/L	20	20.9	105	70-125	
Xylene (Total)	ug/L	60	60.6	101	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			97	75-125	
Toluene-d8 (S)	%			103	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729849 2729850

Parameter	Units	10405951002		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	MS Result	MSD Result							
1,1,1,2-Tetrachloroethane	ug/L	<0.50	20	20	21.3	19.6	106	98	75-137	8	30		
1,1,1-Trichloroethane	ug/L	<0.50	20	20	22.7	19.9	113	100	75-139	13	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.50	20	20	22.2	20.8	111	104	60-142	7	30		
1,1,2-Trichloroethane	ug/L	<0.50	20	20	20.9	18.7	105	94	75-128	11	30		

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Parameter	Units	10405951002		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729849 2729850																
1,1,2-Trichlorotrifluoroethane	ug/L	<1.0	20	20	21.7	20.1	109	100	62-150	8	30					
1,1-Dichloroethane	ug/L	<0.50	20	20	21.6	19.6	108	98	70-129	10	30					
1,1-Dichloroethene	ug/L	<0.50	20	20	21.1	19.8	106	99	67-141	7	30					
1,1-Dichloropropene	ug/L	<0.50	20	20	21.7	20.4	109	102	64-144	6	30					
1,2,3-Trichlorobenzene	ug/L	<0.50	20	20	24.1	23.8	121	119	66-139	1	30					
1,2,3-Trichloropropane	ug/L	<4.0	20	20	21.3	20.1	107	100	69-134	6	30					
1,2,4-Trichlorobenzene	ug/L	<0.50	20	20	22.5	21.3	113	106	65-138	6	30					
1,2,4-Trimethylbenzene	ug/L	<1.0	20	20	20.1	18.3	100	91	65-143	9	30					
1,2-Dibromo-3-chloropropane	ug/L	<4.0	50	50	58.3	54.2	117	108	61-134	7	30					
1,2-Dibromoethane (EDB)	ug/L	<0.50	20	20	22.5	20.4	113	102	74-129	10	30					
1,2-Dichlorobenzene	ug/L	<0.50	20	20	22.2	20.3	111	102	68-135	9	30					
1,2-Dichloroethane	ug/L	<0.50	20	20	19.4	17.6	97	88	73-125	10	30					
1,2-Dichloroethene (Total)	ug/L	<1.0	40	40	40.7	37.7	102	94	69-134	8	30					
1,2-Dichloropropane	ug/L	<4.0	20	20	21.3	19.3	106	97	64-130	10	30					
1,3,5-Trimethylbenzene	ug/L	<0.50	20	20	22.2	20.4	111	102	64-146	9	30					
1,3-Dichlorobenzene	ug/L	<0.50	20	20	21.2	19.4	106	97	69-135	8	30					
1,3-Dichloropropane	ug/L	<0.50	20	20	22.6	20.2	113	101	67-128	11	30					
1,4-Dichlorobenzene	ug/L	<0.50	20	20	22.4	20.2	112	101	66-134	10	30					
1,4-Dioxane (p-Dioxane)	ug/L	<200	400	400	370	365	92	91	58-140	1	30					
2,2,4-Trimethylpentane	ug/L	<4.0	20	20	20.5	18.6	102	93	48-150	10	30					
2,2-Dichloropropane	ug/L	<1.0	20	20	20.3	18.6	101	93	50-150	9	30					
2-Butanone (MEK)	ug/L	<5.0	100	100	97.5	92.3	98	92	58-125	5	30					
2-Chlorotoluene	ug/L	<0.50	20	20	21.6	20.0	108	100	65-138	7	30					
2-Hexanone	ug/L	<5.0	100	100	119	109	119	109	61-134	9	30					
4-Chlorotoluene	ug/L	<0.50	20	20	22.3	20.4	111	102	68-135	9	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	100	100	118	108	118	108	61-130	9	30					
Acetone	ug/L	<20.0	100	100	191	171	191	171	51-140	11	30	M0				
Acrolein	ug/L	<10.0	200	200	204	180	102	90	48-150	12	30					
Acrylonitrile	ug/L	<10.0	200	200	209	189	105	95	55-134	10	30					
Benzene	ug/L	<0.50	20	20	21.6	20.0	108	100	63-132	7	30					
Bromobenzene	ug/L	<0.50	20	20	21.6	20.4	108	102	67-138	6	30					
Bromochloromethane	ug/L	<1.0	20	20	21.3	19.3	107	96	66-138	10	30					
Bromodichloromethane	ug/L	0.55	20	20	22.3	19.9	109	97	75-137	11	30					
Bromoform	ug/L	<4.0	20	20	21.1	18.8	105	94	65-129	11	30					
Bromomethane	ug/L	<4.0	20	20	18.0	19.2	90	96	41-150	6	30					
Carbon disulfide	ug/L	<1.0	20	20	20.0	18.5	100	93	72-132	8	30					
Carbon tetrachloride	ug/L	<0.50	20	20	21.5	19.9	108	99	75-150	8	30					
Chlorobenzene	ug/L	<0.50	20	20	22.3	20.4	111	102	73-127	9	30					
Chloroethane	ug/L	<1.0	20	20	16.6	17.8	83	89	74-138	7	30					
Chloroform	ug/L	6.7	20	20	25.5	23.6	94	84	74-125	8	30					
Chloromethane	ug/L	<4.0	20	20	18.5	19.5	92	97	58-129	5	30					
cis-1,2-Dichloroethene	ug/L	<0.50	20	20	20.4	18.7	102	94	63-135	9	30					
cis-1,3-Dichloropropene	ug/L	<0.50	20	20	18.5	16.4	92	82	66-129	12	30					
Dibromochloromethane	ug/L	<0.50	20	20	22.4	20.2	112	101	75-133	10	30					

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Parameter	Units	2729849		2729850		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10405951002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<1.0	20	20	21.4	19.1	107	96	68-134	11	30		
Dichlorodifluoromethane	ug/L	<1.0	20	20	19.5	20.8	97	104	72-150	7	30		
Dichlorofluoromethane	ug/L	<1.0	20	20	18.4	19.9	92	100	75-129	8	30		
Diisopropyl ether	ug/L	<1.0	20	20	19.5	17.9	97	89	62-128	9	30		
Ethyl-tert-butyl ether	ug/L	<0.50	20	20	20.3	18.4	101	92	63-132	9	30		
Ethylbenzene	ug/L	<0.50	20	20	22.5	20.7	113	104	72-130	8	30		
Hexachloro-1,3-butadiene	ug/L	<1.0	20	20	24.1	21.3	120	107	71-150	12	30		
Isopropylbenzene (Cumene)	ug/L	<0.50	20	20	20.9	19.5	105	98	70-136	7	30		
m&p-Xylene	ug/L	<1.0	40	40	41.6	38.4	104	96	64-142	8	30		
Methyl-tert-butyl ether	ug/L	<0.50	20	20	19.3	17.9	96	89	72-125	8	30		
Methylene Chloride	ug/L	<4.0	20	20	19.1	16.9	96	85	60-132	12	30		
n-Butylbenzene	ug/L	<0.50	20	20	21.7	19.6	109	98	60-150	10	30		
n-Propylbenzene	ug/L	<0.50	20	20	22.4	20.8	112	104	63-142	7	30		
Naphthalene	ug/L	<1.0	20	20	23.4	23.1	117	116	67-125	1	30		
o-Xylene	ug/L	<0.50	20	20	21.9	20.5	109	103	60-143	7	30		
p-Isopropyltoluene	ug/L	<1.0	20	20	20.5	18.6	103	93	64-146	10	30		
sec-Butylbenzene	ug/L	<0.50	20	20	21.5	19.9	107	99	67-144	8	30		
Styrene	ug/L	<1.0	20	20	20.0	18.2	100	91	67-136	10	30		
tert-Amylmethyl ether	ug/L	<0.50	20	20	20.5	18.7	102	94	60-134	9	30		
tert-Butyl Alcohol	ug/L	<10.0	200	200	208	184	104	92	56-146	12	30		
tert-Butylbenzene	ug/L	<0.50	20	20	22.1	20.6	111	103	68-135	7	30		
Tetrachloroethene	ug/L	<0.50	20	20	23.2	21.9	116	109	67-148	6	30		
Tetrahydrofuran	ug/L	<10.0	200	200	382	330	191	165	51-141	15	30	MO	
Toluene	ug/L	<0.50	20	20	20.4	18.7	102	94	61-140	8	30		
trans-1,2-Dichloroethene	ug/L	<0.50	20	20	20.3	19.0	102	95	62-138	7	30		
trans-1,3-Dichloropropene	ug/L	<0.50	20	20	20.5	18.8	103	94	67-134	9	30		
trans-1,4-Dichloro-2-butene	ug/L	<10.0	50	50	49.9	44.4	100	89	30-150	12	30		
Trichloroethene	ug/L	9.3	20	20	31.0	29.1	108	99	64-149	6	30		
Trichlorofluoromethane	ug/L	<0.50	20	20	19.3	21.2	97	106	75-150	9	30		
Vinyl acetate	ug/L	<10.0	20	20	17.5	15.9	88	80	49-143	10	30		
Vinyl chloride	ug/L	ND	20	20	20.4	22.1	102	111	75-133	8	30		
Xylene (Total)	ug/L	<1.5	60	60	63.5	58.9	106	98	63-142	8	30		
1,2-Dichloroethane-d4 (S)	%						98	100	75-137				
4-Bromofluorobenzene (S)	%						103	104	75-125				
Toluene-d8 (S)	%						103	100	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease-Revised Report

Pace Project No.: 10405934

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10405934001	MW21D-GW-100217	EPA 8260B	502264		
10405934002	MW16D-GW-100217	EPA 8260B	502264		
10405934003	MW18D-GW-100217	EPA 8260B	502264		
10405934004	MW15D-GW-100217	EPA 8260B	502264		
10405934005	Trip Blank	EPA 8260B	502264		

### REPORT OF LABORATORY ANALYSIS

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Section A

Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201

Report To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com

Email:   
 Fax:   
 Project #: 1497

Requested Due Date: 10 Day Standard

Section B

Required Project Information:

Attention: Anne Walsh  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Contract# 758938  
 Purchase Order # PEDD# 1497  
 Project Name: Freeman WA-Grain Handling Facility  
 Project #: 1497

State / Location: WA / Freeman  
 Regulatory Agency:

Section C

Invoice Information:

Requested Analysis Filtered (Y/N)

MS/MSD Requested	Y
Nitrates+Nitrite 353.2	
COD 410.4	
Methane, Ethane, Ethane RSK175	
Sulfide 4500	
TOC 5310	
2540 TDS	
Chloride, Sulfate, Nitrate 300.0	
2320 Alkalinity	
6010/7470 TAL Dissolved Metals *	
Low Level VOCs by 8260	

ITEM #	MATRIX CODE One Character per box. (A-Z, 0-9, -, /) Sample IDs must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	DATE		TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES	ANALYSES TEST	Y/N	ADDITIONAL COMMENTS	
				START	END							DATE	TIME
1	MW 210-GW-100217			12:05	12:05	12:05	3	W				3.4	
2	MW 160-GW-100217			13:40	13:40	13:40	3	W				3.4	
3	MW 180-GW-100217			14:30	14:30	14:30	3	W				3.4	
4	MW 150-GW-100217						2	W				3.4	
5	Tip Blank						2	W				3.4	
6													
7													
8													
9													
10													
11													
12													

SAMPLER NAME AND SIGNATURE	Steve Demus
PRINT Name of SAMPLER:	Steve Demus
SIGNATURE of SAMPLER:	[Signature]
DATE Signed:	10-2-17

TEMP in C	
Received on ice (Y/N)	
Quastody Sealed Cooler (Y/N)	Y
Samples Intact (Y/N)	Y



Document Name:  
**Sample Condition Upon Receipt Form**

Document No.:  
**F-MN-L-213-rev.21**

Document Revised: 30Aug2017  
Page 1 of 2

Issuing Authority:  
Pace Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: CH2M Hill

Project #: **WO# : 10405934**

**WO# : 10405934**

10405934

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 7222 2739 8665

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB      Temp Blank?  Yes  No

Thermometer  151401163      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Used:  G87A9155100842

Cooler Temp Read (°C): 3.6      Cooler Temp Corrected (°C): 3.4      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: 0.2      Date and Initials of Person Examining Contents: SK 10-4-17

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>SK 10-4-17</u>	
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: <input checked="" type="checkbox"/> Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>See exceptions</u>
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>unreadable</u>		<u>10-4-17</u>

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: Steve Demus      Field Data Required?  Yes  No  
 Date/Time: 10/05/17


Comments/Resolution: Proceed with analysis on vials with headspace.

**Project Manager Review:**

JENNI GROSS

Date: 10/05/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

	Document Name: <b>Sample Condition Upon Receipt Form</b>	Document Revised: 30Aug2017 Page 2 of 2
	Document No.: <b>F-MN-L-213-rev.21</b>	Issuing Authority: Pace Minnesota Quality Office

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
Headspace 7Cmm	NW21D-ADJ-100217	3/3 V69H
"	NW16D-GW-100217	2/3 J69H
Headspace 4Cmm	"	1/3 V69H
Headspace 7Cmm	NW15D-GW-100217	3/3 V69H
"	Trip Blank 1/2	

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials



October 18, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

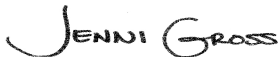
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10406354

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory between October 07, 2017 and October 09, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10406354

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10406354001	MW6D-GW-100517	Water	10/05/17 09:35	10/07/17 09:35
10406354002	MW4D-GW-100517	Water	10/05/17 11:25	10/07/17 09:35
10406354003	MW9D-GW-100517	Water	10/05/17 12:40	10/07/17 09:35
10406354005	MW20D-GW-100517	Water	10/05/17 15:10	10/09/17 09:30
10406354006	MW19D-GW-100517	Water	10/05/17 13:55	10/09/17 09:30
10406354007	FD-GW-100517	Water	10/05/17 17:00	10/09/17 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10406354001	MW6D-GW-100517	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10406354002	MW4D-GW-100517	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10406354003	MW9D-GW-100517	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10406354005	MW20D-GW-100517	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10406354006	MW19D-GW-100517	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
10406354007	FD-GW-100517	6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10406354001</b>	<b>MW6D-GW-100517</b>					
RSK 175	Methane	3.0J	ug/L	10.0	10/09/17 10:31	
6010C Met	Aluminum, Dissolved	8.8J	ug/L	200	10/17/17 10:32	
6010C Met	Barium, Dissolved	15.5	ug/L	10.0	10/17/17 10:32	
6010C Met	Calcium, Dissolved	36100	ug/L	500	10/17/17 10:32	
6010C Met	Copper, Dissolved	1.1J	ug/L	10.0	10/17/17 10:32	
6010C Met	Magnesium, Dissolved	16700	ug/L	500	10/17/17 10:32	
6010C Met	Manganese, Dissolved	21.3	ug/L	5.0	10/17/17 10:32	
6010C Met	Potassium, Dissolved	7980	ug/L	2500	10/17/17 10:32	
6010C Met	Sodium, Dissolved	21000	ug/L	1000	10/17/17 10:32	
6010C Met	Vanadium, Dissolved	14.6J	ug/L	15.0	10/17/17 10:32	
6010C Met	Zinc, Dissolved	2.4J	ug/L	20.0	10/17/17 10:32	
SM 2320B	Alkalinity, Total as CaCO3	195	mg/L	5.0	10/12/17 14:17	
SM 2540C	Total Dissolved Solids	239	mg/L	10.0	10/09/17 10:27	
EPA 300.0	Chloride	3.3	mg/L	1.2	10/07/17 15:39	
EPA 300.0	Nitrate as N	0.51	mg/L	0.10	10/07/17 15:39	H1
EPA 300.0	Sulfate	5.4	mg/L	1.2	10/07/17 15:39	
EPA 353.2	Nitrogen, NO2 plus NO3	0.60	mg/L	0.020	10/14/17 10:04	
SM 5310C	Total Organic Carbon	0.51J	mg/L	1.0	10/12/17 13:41	
<b>10406354002</b>	<b>MW4D-GW-100517</b>					
RSK 175	Methane	1.8J	ug/L	10.0	10/09/17 10:39	
6010C Met	Aluminum, Dissolved	407	ug/L	200	10/17/17 10:52	
6010C Met	Barium, Dissolved	52.9	ug/L	10.0	10/17/17 10:52	
6010C Met	Calcium, Dissolved	42600	ug/L	500	10/17/17 10:52	
6010C Met	Chromium, Dissolved	0.71J	ug/L	10.0	10/17/17 10:52	
6010C Met	Copper, Dissolved	3.0J	ug/L	10.0	10/17/17 10:52	
6010C Met	Iron, Dissolved	638	ug/L	50.0	10/17/17 10:52	
6010C Met	Magnesium, Dissolved	14700	ug/L	500	10/17/17 10:52	
6010C Met	Manganese, Dissolved	27.9	ug/L	5.0	10/17/17 10:52	
6010C Met	Nickel, Dissolved	15.8J	ug/L	20.0	10/17/17 10:52	
6010C Met	Potassium, Dissolved	3820	ug/L	2500	10/17/17 10:52	
6010C Met	Sodium, Dissolved	25500	ug/L	1000	10/17/17 10:52	
6010C Met	Vanadium, Dissolved	10.8J	ug/L	15.0	10/17/17 10:52	
6010C Met	Zinc, Dissolved	28.9	ug/L	20.0	10/17/17 10:52	
SM 2320B	Alkalinity, Total as CaCO3	183	mg/L	5.0	10/12/17 14:22	
SM 2540C	Total Dissolved Solids	271	mg/L	10.0	10/10/17 15:19	
SM 4500-S-2 D	Sulfide, Total	0.0054J	mg/L	0.020	10/12/17 12:55	
EPA 300.0	Chloride	6.8	mg/L	1.2	10/07/17 16:42	
EPA 300.0	Nitrate as N	1.5	mg/L	0.10	10/07/17 16:42	H1
EPA 300.0	Sulfate	16.7	mg/L	1.2	10/07/17 16:42	
EPA 353.2	Nitrogen, NO2 plus NO3	1.6	mg/L	0.020	10/14/17 10:05	
SM 5310C	Total Organic Carbon	0.93J	mg/L	1.0	10/12/17 14:20	
<b>10406354003</b>	<b>MW9D-GW-100517</b>					
6010C Met	Aluminum, Dissolved	16.4J	ug/L	200	10/17/17 10:56	
6010C Met	Barium, Dissolved	27.3	ug/L	10.0	10/17/17 10:56	
6010C Met	Calcium, Dissolved	50300	ug/L	500	10/17/17 10:56	
6010C Met	Copper, Dissolved	2.0J	ug/L	10.0	10/17/17 10:56	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10406354003</b>	<b>MW9D-GW-100517</b>					
6010C Met	Iron, Dissolved	39.1J	ug/L	50.0	10/17/17 10:56	
6010C Met	Magnesium, Dissolved	14800	ug/L	500	10/17/17 10:56	
6010C Met	Manganese, Dissolved	4.5J	ug/L	5.0	10/17/17 10:56	
6010C Met	Potassium, Dissolved	2610	ug/L	2500	10/17/17 10:56	
6010C Met	Sodium, Dissolved	18300	ug/L	1000	10/17/17 10:56	
6010C Met	Vanadium, Dissolved	8.6J	ug/L	15.0	10/17/17 10:56	
6010C Met	Zinc, Dissolved	3.8J	ug/L	20.0	10/17/17 10:56	
SM 2320B	Alkalinity, Total as CaCO3	166	mg/L	5.0	10/12/17 14:25	
SM 2540C	Total Dissolved Solids	274	mg/L	10.0	10/10/17 15:19	
EPA 300.0	Chloride	8.9	mg/L	1.2	10/07/17 16:57	
EPA 300.0	Nitrate as N	2.8	mg/L	0.10	10/07/17 16:57	H1
EPA 300.0	Sulfate	27.4	mg/L	1.2	10/07/17 16:57	
EPA 353.2	Nitrogen, NO2 plus NO3	2.8	mg/L	0.10	10/14/17 11:03	
SM 5310C	Total Organic Carbon	0.89J	mg/L	1.0	10/12/17 14:34	
<b>10406354005</b>	<b>MW20D-GW-100517</b>					
RSK 175	Methane	2.0J	ug/L	10.0	10/10/17 10:39	
6010C Met	Aluminum, Dissolved	14.8J	ug/L	200	10/17/17 10:59	
6010C Met	Barium, Dissolved	25.1	ug/L	10.0	10/17/17 10:59	
6010C Met	Calcium, Dissolved	61500	ug/L	500	10/17/17 10:59	
6010C Met	Copper, Dissolved	1.3J	ug/L	10.0	10/17/17 10:59	
6010C Met	Magnesium, Dissolved	23300	ug/L	500	10/17/17 10:59	
6010C Met	Manganese, Dissolved	19.2	ug/L	5.0	10/17/17 10:59	
6010C Met	Potassium, Dissolved	4140	ug/L	2500	10/17/17 10:59	
6010C Met	Sodium, Dissolved	22700	ug/L	1000	10/17/17 10:59	
6010C Met	Vanadium, Dissolved	5.5J	ug/L	15.0	10/17/17 10:59	
6010C Met	Zinc, Dissolved	1.9J	ug/L	20.0	10/17/17 10:59	
SM 2320B	Alkalinity, Total as CaCO3	268	mg/L	5.0	10/12/17 14:29	
SM 2540C	Total Dissolved Solids	325	mg/L	10.0	10/12/17 09:43	
EPA 300.0	Chloride	5.7	mg/L	1.2	10/09/17 17:59	
EPA 300.0	Nitrate as N	1.1	mg/L	0.10	10/09/17 17:59	H3,M1
EPA 300.0	Sulfate	7.7	mg/L	1.2	10/09/17 17:59	
EPA 353.2	Nitrogen, NO2 plus NO3	1.2	mg/L	0.020	10/14/17 10:07	
SM 5310C	Total Organic Carbon	0.95J	mg/L	1.0	10/12/17 14:47	
<b>10406354006</b>	<b>MW19D-GW-100517</b>					
RSK 175	Methane	1.7J	ug/L	10.0	10/10/17 10:46	
6010C Met	Aluminum, Dissolved	44.2J	ug/L	200	10/17/17 11:11	
6010C Met	Barium, Dissolved	12.7	ug/L	10.0	10/17/17 11:11	
6010C Met	Calcium, Dissolved	44700	ug/L	500	10/17/17 11:11	
6010C Met	Copper, Dissolved	2.0J	ug/L	10.0	10/17/17 11:11	
6010C Met	Magnesium, Dissolved	19300	ug/L	500	10/17/17 11:11	
6010C Met	Manganese, Dissolved	6.9	ug/L	5.0	10/17/17 11:11	
6010C Met	Potassium, Dissolved	4720	ug/L	2500	10/17/17 11:11	
6010C Met	Sodium, Dissolved	17300	ug/L	1000	10/17/17 11:11	
6010C Met	Vanadium, Dissolved	5.7J	ug/L	15.0	10/17/17 11:11	
6010C Met	Zinc, Dissolved	6.0J	ug/L	20.0	10/17/17 11:11	
SM 2320B	Alkalinity, Total as CaCO3	181	mg/L	5.0	10/12/17 14:34	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10406354006</b>	<b>MW19D-GW-100517</b>					
SM 2540C	Total Dissolved Solids	283	mg/L	10.0	10/12/17 09:43	
EPA 300.0	Chloride	7.0	mg/L	1.2	10/09/17 19:01	
EPA 300.0	Nitrate as N	4.4	mg/L	0.10	10/09/17 19:01	H3
EPA 300.0	Sulfate	23.4	mg/L	1.2	10/09/17 19:01	
EPA 353.2	Nitrogen, NO2 plus NO3	4.5	mg/L	0.10	10/14/17 11:05	
SM 5310C	Total Organic Carbon	0.65J	mg/L	1.0	10/12/17 15:26	
<b>10406354007</b>	<b>FD-GW-100517</b>					
RSK 175	Methane	2.2J	ug/L	10.0	10/10/17 10:54	
6010C Met	Barium, Dissolved	12.3	ug/L	10.0	10/17/17 11:15	
6010C Met	Calcium, Dissolved	44700	ug/L	500	10/17/17 11:15	
6010C Met	Copper, Dissolved	2.0J	ug/L	10.0	10/17/17 11:15	
6010C Met	Magnesium, Dissolved	19300	ug/L	500	10/17/17 11:15	
6010C Met	Manganese, Dissolved	7.0	ug/L	5.0	10/17/17 11:15	
6010C Met	Potassium, Dissolved	4730	ug/L	2500	10/17/17 11:15	
6010C Met	Sodium, Dissolved	17400	ug/L	1000	10/17/17 11:15	
6010C Met	Vanadium, Dissolved	5.5J	ug/L	15.0	10/17/17 11:15	
6010C Met	Zinc, Dissolved	5.1J	ug/L	20.0	10/17/17 11:15	
SM 2320B	Alkalinity, Total as CaCO3	184	mg/L	5.0	10/12/17 14:38	
SM 2540C	Total Dissolved Solids	303	mg/L	10.0	10/12/17 09:43	
EPA 300.0	Chloride	7.1	mg/L	1.2	10/09/17 19:17	
EPA 300.0	Nitrate as N	4.5	mg/L	0.10	10/09/17 19:17	H3
EPA 300.0	Sulfate	23.6	mg/L	1.2	10/09/17 19:17	
EPA 353.2	Nitrogen, NO2 plus NO3	4.7	mg/L	0.10	10/14/17 11:06	
SM 5310C	Total Organic Carbon	0.66J	mg/L	1.0	10/12/17 15:39	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502221

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406190010,10406500006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2729575)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2729576)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2729578)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 91652

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2062956001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 393954)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

### General Information:

6 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW4D-GW-100517 (Lab ID: 10406354002)
- MW6D-GW-100517 (Lab ID: 10406354001)
- MW9D-GW-100517 (Lab ID: 10406354003)

H3: Sample was received or analysis requested beyond the recognized method holding time.

- FD-GW-100517 (Lab ID: 10406354007)
- MW19D-GW-100517 (Lab ID: 10406354006)
- MW20D-GW-100517 (Lab ID: 10406354005)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 501489

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406354005

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2725914)
  - Nitrate as N
- MSD (Lab ID: 2725915)
  - Nitrate as N

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502447

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406714001,10406825004

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 2730804)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

### General Information:

6 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502082

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406328001,10406328002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2729069)
  - Chemical Oxygen Demand
- MS (Lab ID: 2729071)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2729070)
  - Chemical Oxygen Demand

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** October 18, 2017

**General Information:**

6 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

**Sample: MW6D-GW-100517**      **Lab ID: 10406354001**      Collected: 10/05/17 09:35      Received: 10/07/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/09/17 10:31	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/09/17 10:31	74-85-1	
Methane	3.0J	ug/L	10.0	1.1	1		10/09/17 10:31	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	8.8J	ug/L	200	8.6	1	10/12/17 10:38	10/17/17 10:32	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/12/17 10:38	10/17/17 10:32	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/12/17 10:38	10/17/17 10:32	7440-38-2	
Barium, Dissolved	15.5	ug/L	10.0	0.22	1	10/12/17 10:38	10/17/17 10:32	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/12/17 10:38	10/17/17 10:32	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/12/17 10:38	10/17/17 10:32	7440-43-9	
Calcium, Dissolved	36100	ug/L	500	24.7	1	10/12/17 10:38	10/17/17 10:32	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/12/17 10:38	10/17/17 10:32	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/12/17 10:38	10/17/17 10:32	7440-48-4	
Copper, Dissolved	1.1J	ug/L	10.0	0.83	1	10/12/17 10:38	10/17/17 10:32	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/12/17 10:38	10/17/17 10:32	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/12/17 10:38	10/17/17 10:32	7439-92-1	
Magnesium, Dissolved	16700	ug/L	500	2.6	1	10/12/17 10:38	10/17/17 10:32	7439-95-4	
Manganese, Dissolved	21.3	ug/L	5.0	0.38	1	10/12/17 10:38	10/17/17 10:32	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/12/17 10:38	10/17/17 10:32	7440-02-0	
Potassium, Dissolved	7980	ug/L	2500	126	1	10/12/17 10:38	10/17/17 10:32	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/12/17 10:38	10/17/17 10:32	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/12/17 10:38	10/17/17 10:32	7440-22-4	
Sodium, Dissolved	21000	ug/L	1000	44.6	1	10/12/17 10:38	10/17/17 10:32	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/12/17 10:38	10/17/17 10:32	7440-28-0	
Vanadium, Dissolved	14.6J	ug/L	15.0	0.42	1	10/12/17 10:38	10/17/17 10:32	7440-62-2	
Zinc, Dissolved	2.4J	ug/L	20.0	1.8	1	10/12/17 10:38	10/17/17 10:32	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/09/17 10:04	10/11/17 15:56	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	195	mg/L	5.0	1.4	1		10/12/17 14:17		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	239	mg/L	10.0	5.0	1		10/09/17 10:27		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/12/17 12:55	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.3	mg/L	1.2	0.14	1		10/07/17 15:39	16887-00-6	
Nitrate as N	0.51	mg/L	0.10	0.0079	1		10/07/17 15:39	14797-55-8	H1
Sulfate	5.4	mg/L	1.2	0.27	1		10/07/17 15:39	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Sample: MW6D-GW-100517**      **Lab ID: 10406354001**      Collected: 10/05/17 09:35      Received: 10/07/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.60</b>	mg/L	0.020	0.0075	1		10/14/17 10:04		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/17/17 12:19	10/18/17 12:42		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.51J</b>	mg/L	1.0	0.20	1		10/12/17 13:41	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

**Sample: MW4D-GW-100517**      **Lab ID: 10406354002**      Collected: 10/05/17 11:25      Received: 10/07/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/09/17 10:39	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/09/17 10:39	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		10/09/17 10:39	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	407	ug/L	200	8.6	1	10/12/17 10:38	10/17/17 10:52	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/12/17 10:38	10/17/17 10:52	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/12/17 10:38	10/17/17 10:52	7440-38-2	
Barium, Dissolved	52.9	ug/L	10.0	0.22	1	10/12/17 10:38	10/17/17 10:52	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/12/17 10:38	10/17/17 10:52	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/12/17 10:38	10/17/17 10:52	7440-43-9	
Calcium, Dissolved	42600	ug/L	500	24.7	1	10/12/17 10:38	10/17/17 10:52	7440-70-2	
Chromium, Dissolved	0.71J	ug/L	10.0	0.50	1	10/12/17 10:38	10/17/17 10:52	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/12/17 10:38	10/17/17 10:52	7440-48-4	
Copper, Dissolved	3.0J	ug/L	10.0	0.83	1	10/12/17 10:38	10/17/17 10:52	7440-50-8	
Iron, Dissolved	638	ug/L	50.0	16.7	1	10/12/17 10:38	10/17/17 10:52	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/12/17 10:38	10/17/17 10:52	7439-92-1	
Magnesium, Dissolved	14700	ug/L	500	2.6	1	10/12/17 10:38	10/17/17 10:52	7439-95-4	
Manganese, Dissolved	27.9	ug/L	5.0	0.38	1	10/12/17 10:38	10/17/17 10:52	7439-96-5	
Nickel, Dissolved	15.8J	ug/L	20.0	1.1	1	10/12/17 10:38	10/17/17 10:52	7440-02-0	
Potassium, Dissolved	3820	ug/L	2500	126	1	10/12/17 10:38	10/17/17 10:52	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/12/17 10:38	10/17/17 10:52	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/12/17 10:38	10/17/17 10:52	7440-22-4	
Sodium, Dissolved	25500	ug/L	1000	44.6	1	10/12/17 10:38	10/17/17 10:52	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/12/17 10:38	10/17/17 10:52	7440-28-0	
Vanadium, Dissolved	10.8J	ug/L	15.0	0.42	1	10/12/17 10:38	10/17/17 10:52	7440-62-2	
Zinc, Dissolved	28.9	ug/L	20.0	1.8	1	10/12/17 10:38	10/17/17 10:52	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/09/17 10:04	10/11/17 15:58	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	183	mg/L	5.0	1.4	1		10/12/17 14:22		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	271	mg/L	10.0	5.0	1		10/10/17 15:19		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0054J	mg/L	0.020	0.0050	1		10/12/17 12:55	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	6.8	mg/L	1.2	0.14	1		10/07/17 16:42	16887-00-6	
Nitrate as N	1.5	mg/L	0.10	0.0079	1		10/07/17 16:42	14797-55-8	H1
Sulfate	16.7	mg/L	1.2	0.27	1		10/07/17 16:42	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Sample: MW4D-GW-100517**      **Lab ID: 10406354002**      Collected: 10/05/17 11:25      Received: 10/07/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.6</b>	mg/L	0.020	0.0075	1		10/14/17 10:05		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/17/17 12:19	10/18/17 12:43		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.93J</b>	mg/L	1.0	0.20	1		10/12/17 14:20	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

**Sample: MW9D-GW-100517**      **Lab ID: 10406354003**      Collected: 10/05/17 12:40      Received: 10/07/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/09/17 10:46	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/09/17 10:46	74-85-1	
Methane	<1.1	ug/L	10.0	1.1	1		10/09/17 10:46	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<b>16.4J</b>	ug/L	200	8.6	1	10/12/17 10:38	10/17/17 10:56	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/12/17 10:38	10/17/17 10:56	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/12/17 10:38	10/17/17 10:56	7440-38-2	
Barium, Dissolved	<b>27.3</b>	ug/L	10.0	0.22	1	10/12/17 10:38	10/17/17 10:56	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/12/17 10:38	10/17/17 10:56	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/12/17 10:38	10/17/17 10:56	7440-43-9	
Calcium, Dissolved	<b>50300</b>	ug/L	500	24.7	1	10/12/17 10:38	10/17/17 10:56	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/12/17 10:38	10/17/17 10:56	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/12/17 10:38	10/17/17 10:56	7440-48-4	
Copper, Dissolved	<b>2.0J</b>	ug/L	10.0	0.83	1	10/12/17 10:38	10/17/17 10:56	7440-50-8	
Iron, Dissolved	<b>39.1J</b>	ug/L	50.0	16.7	1	10/12/17 10:38	10/17/17 10:56	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/12/17 10:38	10/17/17 10:56	7439-92-1	
Magnesium, Dissolved	<b>14800</b>	ug/L	500	2.6	1	10/12/17 10:38	10/17/17 10:56	7439-95-4	
Manganese, Dissolved	<b>4.5J</b>	ug/L	5.0	0.38	1	10/12/17 10:38	10/17/17 10:56	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/12/17 10:38	10/17/17 10:56	7440-02-0	
Potassium, Dissolved	<b>2610</b>	ug/L	2500	126	1	10/12/17 10:38	10/17/17 10:56	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/12/17 10:38	10/17/17 10:56	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/12/17 10:38	10/17/17 10:56	7440-22-4	
Sodium, Dissolved	<b>18300</b>	ug/L	1000	44.6	1	10/12/17 10:38	10/17/17 10:56	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/12/17 10:38	10/17/17 10:56	7440-28-0	
Vanadium, Dissolved	<b>8.6J</b>	ug/L	15.0	0.42	1	10/12/17 10:38	10/17/17 10:56	7440-62-2	
Zinc, Dissolved	<b>3.8J</b>	ug/L	20.0	1.8	1	10/12/17 10:38	10/17/17 10:56	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/09/17 10:04	10/11/17 16:05	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	<b>166</b>	mg/L	5.0	1.4	1		10/12/17 14:25		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	<b>274</b>	mg/L	10.0	5.0	1		10/10/17 15:19		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/12/17 12:56	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	<b>8.9</b>	mg/L	1.2	0.14	1		10/07/17 16:57	16887-00-6	
Nitrate as N	<b>2.8</b>	mg/L	0.10	0.0079	1		10/07/17 16:57	14797-55-8	H1
Sulfate	<b>27.4</b>	mg/L	1.2	0.27	1		10/07/17 16:57	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Sample: MW9D-GW-100517**      **Lab ID: 10406354003**      Collected: 10/05/17 12:40      Received: 10/07/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>2.8</b>	mg/L	0.10	0.037	5		10/14/17 11:03		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/17/17 12:19	10/18/17 12:43		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.89J</b>	mg/L	1.0	0.20	1		10/12/17 14:34	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

**Sample:** MW20D-GW-100517    **Lab ID:** 10406354005    Collected: 10/05/17 15:10    Received: 10/09/17 09:30    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/10/17 10:39	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/10/17 10:39	74-85-1	
Methane	2.0J	ug/L	10.0	1.1	1		10/10/17 10:39	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	14.8J	ug/L	200	8.6	1	10/12/17 10:38	10/17/17 10:59	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/12/17 10:38	10/17/17 10:59	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/12/17 10:38	10/17/17 10:59	7440-38-2	
Barium, Dissolved	25.1	ug/L	10.0	0.22	1	10/12/17 10:38	10/17/17 10:59	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/12/17 10:38	10/17/17 10:59	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/12/17 10:38	10/17/17 10:59	7440-43-9	
Calcium, Dissolved	61500	ug/L	500	24.7	1	10/12/17 10:38	10/17/17 10:59	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/12/17 10:38	10/17/17 10:59	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/12/17 10:38	10/17/17 10:59	7440-48-4	
Copper, Dissolved	1.3J	ug/L	10.0	0.83	1	10/12/17 10:38	10/17/17 10:59	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/12/17 10:38	10/17/17 10:59	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/12/17 10:38	10/17/17 10:59	7439-92-1	
Magnesium, Dissolved	23300	ug/L	500	2.6	1	10/12/17 10:38	10/17/17 10:59	7439-95-4	
Manganese, Dissolved	19.2	ug/L	5.0	0.38	1	10/12/17 10:38	10/17/17 10:59	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/12/17 10:38	10/17/17 10:59	7440-02-0	
Potassium, Dissolved	4140	ug/L	2500	126	1	10/12/17 10:38	10/17/17 10:59	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/12/17 10:38	10/17/17 10:59	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/12/17 10:38	10/17/17 10:59	7440-22-4	
Sodium, Dissolved	22700	ug/L	1000	44.6	1	10/12/17 10:38	10/17/17 10:59	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/12/17 10:38	10/17/17 10:59	7440-28-0	
Vanadium, Dissolved	5.5J	ug/L	15.0	0.42	1	10/12/17 10:38	10/17/17 10:59	7440-62-2	
Zinc, Dissolved	1.9J	ug/L	20.0	1.8	1	10/12/17 10:38	10/17/17 10:59	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/11/17 10:09	10/11/17 13:58	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	268	mg/L	5.0	1.4	1		10/12/17 14:29		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	325	mg/L	10.0	5.0	1		10/12/17 09:43		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/12/17 12:57	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.7	mg/L	1.2	0.14	1		10/09/17 17:59	16887-00-6	
Nitrate as N	1.1	mg/L	0.10	0.0079	1		10/09/17 17:59	14797-55-8	H3,M1
Sulfate	7.7	mg/L	1.2	0.27	1		10/09/17 17:59	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Sample: MW20D-GW-100517**      **Lab ID: 10406354005**      Collected: 10/05/17 15:10      Received: 10/09/17 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.2</b>	mg/L	0.020	0.0075	1		10/14/17 10:07		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/17/17 12:19	10/18/17 12:43		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.95J</b>	mg/L	1.0	0.20	1		10/12/17 14:47	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

**Sample: MW19D-GW-100517**      **Lab ID: 10406354006**      Collected: 10/05/17 13:55      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/10/17 10:46	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/10/17 10:46	74-85-1	
Methane	1.7J	ug/L	10.0	1.1	1		10/10/17 10:46	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	44.2J	ug/L	200	8.6	1	10/12/17 10:38	10/17/17 11:11	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/12/17 10:38	10/17/17 11:11	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/12/17 10:38	10/17/17 11:11	7440-38-2	
Barium, Dissolved	12.7	ug/L	10.0	0.22	1	10/12/17 10:38	10/17/17 11:11	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/12/17 10:38	10/17/17 11:11	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/12/17 10:38	10/17/17 11:11	7440-43-9	
Calcium, Dissolved	44700	ug/L	500	24.7	1	10/12/17 10:38	10/17/17 11:11	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/12/17 10:38	10/17/17 11:11	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/12/17 10:38	10/17/17 11:11	7440-48-4	
Copper, Dissolved	2.0J	ug/L	10.0	0.83	1	10/12/17 10:38	10/17/17 11:11	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/12/17 10:38	10/17/17 11:11	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/12/17 10:38	10/17/17 11:11	7439-92-1	
Magnesium, Dissolved	19300	ug/L	500	2.6	1	10/12/17 10:38	10/17/17 11:11	7439-95-4	
Manganese, Dissolved	6.9	ug/L	5.0	0.38	1	10/12/17 10:38	10/17/17 11:11	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/12/17 10:38	10/17/17 11:11	7440-02-0	
Potassium, Dissolved	4720	ug/L	2500	126	1	10/12/17 10:38	10/17/17 11:11	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/12/17 10:38	10/17/17 11:11	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/12/17 10:38	10/17/17 11:11	7440-22-4	
Sodium, Dissolved	17300	ug/L	1000	44.6	1	10/12/17 10:38	10/17/17 11:11	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/12/17 10:38	10/17/17 11:11	7440-28-0	
Vanadium, Dissolved	5.7J	ug/L	15.0	0.42	1	10/12/17 10:38	10/17/17 11:11	7440-62-2	
Zinc, Dissolved	6.0J	ug/L	20.0	1.8	1	10/12/17 10:38	10/17/17 11:11	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/11/17 10:09	10/11/17 14:05	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	181	mg/L	5.0	1.4	1		10/12/17 14:34		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	283	mg/L	10.0	5.0	1		10/12/17 09:43		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/12/17 12:57	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.0	mg/L	1.2	0.14	1		10/09/17 19:01	16887-00-6	
Nitrate as N	4.4	mg/L	0.10	0.0079	1		10/09/17 19:01	14797-55-8	H3
Sulfate	23.4	mg/L	1.2	0.27	1		10/09/17 19:01	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Sample: MW19D-GW-100517**      **Lab ID: 10406354006**      Collected: 10/05/17 13:55      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.5</b>	mg/L	0.10	0.037	5		10/14/17 11:05		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/17/17 12:19	10/18/17 12:43		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.65J</b>	mg/L	1.0	0.20	1		10/12/17 15:26	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

**Sample: FD-GW-100517**      **Lab ID: 10406354007**      Collected: 10/05/17 17:00      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/10/17 10:54	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/10/17 10:54	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		10/10/17 10:54	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/12/17 10:38	10/17/17 11:15	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/12/17 10:38	10/17/17 11:15	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/12/17 10:38	10/17/17 11:15	7440-38-2	
Barium, Dissolved	12.3	ug/L	10.0	0.22	1	10/12/17 10:38	10/17/17 11:15	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/12/17 10:38	10/17/17 11:15	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/12/17 10:38	10/17/17 11:15	7440-43-9	
Calcium, Dissolved	44700	ug/L	500	24.7	1	10/12/17 10:38	10/17/17 11:15	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/12/17 10:38	10/17/17 11:15	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/12/17 10:38	10/17/17 11:15	7440-48-4	
Copper, Dissolved	2.0J	ug/L	10.0	0.83	1	10/12/17 10:38	10/17/17 11:15	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/12/17 10:38	10/17/17 11:15	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/12/17 10:38	10/17/17 11:15	7439-92-1	
Magnesium, Dissolved	19300	ug/L	500	2.6	1	10/12/17 10:38	10/17/17 11:15	7439-95-4	
Manganese, Dissolved	7.0	ug/L	5.0	0.38	1	10/12/17 10:38	10/17/17 11:15	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/12/17 10:38	10/17/17 11:15	7440-02-0	
Potassium, Dissolved	4730	ug/L	2500	126	1	10/12/17 10:38	10/17/17 11:15	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/12/17 10:38	10/17/17 11:15	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/12/17 10:38	10/17/17 11:15	7440-22-4	
Sodium, Dissolved	17400	ug/L	1000	44.6	1	10/12/17 10:38	10/17/17 11:15	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/12/17 10:38	10/17/17 11:15	7440-28-0	
Vanadium, Dissolved	5.5J	ug/L	15.0	0.42	1	10/12/17 10:38	10/17/17 11:15	7440-62-2	
Zinc, Dissolved	5.1J	ug/L	20.0	1.8	1	10/12/17 10:38	10/17/17 11:15	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/11/17 10:09	10/11/17 14:07	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	184	mg/L	5.0	1.4	1		10/12/17 14:38		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	303	mg/L	10.0	5.0	1		10/12/17 09:43		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/12/17 12:58	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.1	mg/L	1.2	0.14	1		10/09/17 19:17	16887-00-6	
Nitrate as N	4.5	mg/L	0.10	0.0079	1		10/09/17 19:17	14797-55-8	H3
Sulfate	23.6	mg/L	1.2	0.27	1		10/09/17 19:17	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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**Sample: FD-GW-100517**      **Lab ID: 10406354007**      Collected: 10/05/17 17:00      Received: 10/09/17 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.7</b>	mg/L	0.10	0.037	5		10/14/17 11:06		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/17/17 12:19	10/18/17 12:43		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.66J</b>	mg/L	1.0	0.20	1		10/12/17 15:39	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501231

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10406354001, 10406354002, 10406354003

METHOD BLANK: 2725026

Matrix: Water

Associated Lab Samples: 10406354001, 10406354002, 10406354003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/09/17 07:51	
Ethene	ug/L	<0.68	10.0	0.68	10/09/17 07:51	
Methane	ug/L	1.5J	10.0	1.1	10/09/17 07:51	

LABORATORY CONTROL SAMPLE & LCSD: 2725027

2725028

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	109	109	96	96	85-115	0	20	
Ethene	ug/L	106	102	102	96	96	85-115	0	20	
Methane	ug/L	60.7	57.2	57.7	94	95	85-115	1	20	

SAMPLE DUPLICATE: 2725031

Parameter	Units	10406354003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	<1.1	1.1J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10406354

QC Batch: 501485 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10406354005, 10406354006, 10406354007

METHOD BLANK: 2725882 Matrix: Water  
Associated Lab Samples: 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/10/17 08:03	
Ethene	ug/L	<0.68	10.0	0.68	10/10/17 08:03	
Methane	ug/L	1.5J	10.0	1.1	10/10/17 08:03	

LABORATORY CONTROL SAMPLE & LCSD: 2725883

Parameter	Units	2725884								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	109	110	96	97	85-115	1	20	
Ethene	ug/L	106	103	103	97	97	85-115	1	20	
Methane	ug/L	60.7	58.2	58.4	96	96	85-115	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725885

Parameter	Units	2725886										Qual
		60254608008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	ND	114	114	79.2	86.9	70	76	30-150	9	20	
Ethene	ug/L	ND	106	106	76.3	81.6	72	77	30-150	7	20	
Methane	ug/L	ND	60.7	60.7	47.0	47.7	74	76	30-150	2	20	

SAMPLE DUPLICATE: 2725887

Parameter	Units	10406354007 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	2.2J	2.3J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501277

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10406354001, 10406354002, 10406354003

METHOD BLANK: 2725146

Matrix: Water

Associated Lab Samples: 10406354001, 10406354002, 10406354003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	10/11/17 15:48	

LABORATORY CONTROL SAMPLE: 2725147

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725148 2725149

Parameter	Units	2725148		2725149		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10406354002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury, Dissolved	ug/L	<0.062	5	5	5.2	5.1	105	101	80-120	3	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501789

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10406354005, 10406354006, 10406354007

METHOD BLANK: 2727388

Matrix: Water

Associated Lab Samples: 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	10/11/17 13:39	

LABORATORY CONTROL SAMPLE: 2727389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.6	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2727390 2727391

Parameter	Units	10406354005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	5.2	5.0	103	101	80-120	3	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 502049 Analysis Method: 6010C Met  
 QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

METHOD BLANK: 2728968 Matrix: Water  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	10/17/17 10:24	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	10/17/17 10:24	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	10/17/17 10:24	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	10/17/17 10:24	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	10/17/17 10:24	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	10/17/17 10:24	
Calcium, Dissolved	ug/L	<24.7	500	24.7	10/17/17 10:24	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	10/17/17 10:24	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	10/17/17 10:24	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	10/17/17 10:24	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	10/17/17 10:24	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	10/17/17 10:24	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	10/17/17 10:24	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	10/17/17 10:24	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	10/17/17 10:24	
Potassium, Dissolved	ug/L	<126	2500	126	10/17/17 10:24	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	10/17/17 10:24	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	10/17/17 10:24	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	10/17/17 10:24	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	10/17/17 10:24	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	10/17/17 10:24	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	10/17/17 10:24	

LABORATORY CONTROL SAMPLE: 2728969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20800	104	80-120	
Antimony, Dissolved	ug/L	1000	1040	104	80-120	
Arsenic, Dissolved	ug/L	1000	1010	101	80-120	
Barium, Dissolved	ug/L	1000	1020	102	80-120	
Beryllium, Dissolved	ug/L	1000	1000	100	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	20300	102	80-120	
Chromium, Dissolved	ug/L	1000	1030	103	80-120	
Cobalt, Dissolved	ug/L	1000	1030	103	80-120	
Copper, Dissolved	ug/L	1000	999	100	80-120	
Iron, Dissolved	ug/L	20000	20600	103	80-120	
Lead, Dissolved	ug/L	1000	1040	104	80-120	
Magnesium, Dissolved	ug/L	20000	21000	105	80-120	
Manganese, Dissolved	ug/L	1000	1040	104	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

LABORATORY CONTROL SAMPLE: 2728969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1040	104	80-120	
Potassium, Dissolved	ug/L	20000	21100	106	80-120	
Selenium, Dissolved	ug/L	1000	1020	102	80-120	
Silver, Dissolved	ug/L	500	494	99	80-120	
Sodium, Dissolved	ug/L	20000	21400	107	80-120	
Thallium, Dissolved	ug/L	1000	1040	104	80-120	
Vanadium, Dissolved	ug/L	1000	1020	102	80-120	
Zinc, Dissolved	ug/L	1000	1050	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2728970 2728971

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10406354001 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	8.8J	20000	20000	20300	20700	102	104	75-125	2	20
Antimony, Dissolved	ug/L	<3.1	1000	1000	1020	1050	102	105	75-125	2	20
Arsenic, Dissolved	ug/L	<5.2	1000	1000	1010	1030	100	103	75-125	2	20
Barium, Dissolved	ug/L	15.5	1000	1000	1030	1050	102	104	75-125	2	20
Beryllium, Dissolved	ug/L	<0.11	1000	1000	981	1000	98	100	75-125	2	20
Cadmium, Dissolved	ug/L	<0.46	1000	1000	1010	1020	101	102	75-125	2	20
Calcium, Dissolved	ug/L	36100	20000	20000	55200	56200	95	101	75-125	2	20
Chromium, Dissolved	ug/L	<0.50	1000	1000	1000	1020	100	102	75-125	2	20
Cobalt, Dissolved	ug/L	<1.1	1000	1000	1000	1020	100	102	75-125	2	20
Copper, Dissolved	ug/L	1.1J	1000	1000	990	1010	99	101	75-125	2	20
Iron, Dissolved	ug/L	<16.7	20000	20000	20100	20400	100	102	75-125	2	20
Lead, Dissolved	ug/L	<3.0	1000	1000	1010	1030	101	103	75-125	2	20
Magnesium, Dissolved	ug/L	16700	20000	20000	36100	36800	97	101	75-125	2	20
Manganese, Dissolved	ug/L	21.3	1000	1000	1030	1050	101	103	75-125	2	20
Nickel, Dissolved	ug/L	<1.1	1000	1000	1000	1020	100	102	75-125	2	20
Potassium, Dissolved	ug/L	7980	20000	20000	29400	29900	107	109	75-125	2	20
Selenium, Dissolved	ug/L	<6.4	1000	1000	1010	1030	101	103	75-125	2	20
Silver, Dissolved	ug/L	<0.27	500	500	499	507	100	101	75-125	2	20
Sodium, Dissolved	ug/L	21000	20000	20000	41100	41800	101	104	75-125	1	20
Thallium, Dissolved	ug/L	<4.8	1000	1000	1010	1030	101	102	75-125	2	20
Vanadium, Dissolved	ug/L	14.6J	1000	1000	1020	1040	100	102	75-125	2	20
Zinc, Dissolved	ug/L	2.4J	1000	1000	1020	1030	102	103	75-125	1	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10406354

QC Batch: 502221 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

METHOD BLANK: 2729572 Matrix: Water  
Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	10/12/17 13:12	

LABORATORY CONTROL SAMPLE & LCSD: 2729573 2729574

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	40.7	38.5	102	96	90-110	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729575 2729576

Parameter	Units	10406190010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	1720	40	40	1790	1950	154	567	80-120	9	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729577 2729578

Parameter	Units	10406500006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	289	40	40	328	319	96	74	80-120	3	30	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501034	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10406354001	

METHOD BLANK: 2723739 Matrix: Water

Associated Lab Samples: 10406354001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/09/17 10:27	

LABORATORY CONTROL SAMPLE: 2723740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 2723741

Parameter	Units	10405964001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	757	737	3	10	

SAMPLE DUPLICATE: 2725208

Parameter	Units	10406354001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	239	247	3	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501644

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10406354002, 10406354003

METHOD BLANK: 2726433

Matrix: Water

Associated Lab Samples: 10406354002, 10406354003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/10/17 15:19	

LABORATORY CONTROL SAMPLE: 2726434

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	500	488	98	80-120	

SAMPLE DUPLICATE: 2726435

Parameter	Units	10406354002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	271	270	0	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501818

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10406354005, 10406354006, 10406354007

METHOD BLANK: 2727491

Matrix: Water

Associated Lab Samples: 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/12/17 09:43	

LABORATORY CONTROL SAMPLE: 2727492

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	994	99	80-120	

SAMPLE DUPLICATE: 2727493

Parameter	Units	10406354005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	325	329	1	10	

SAMPLE DUPLICATE: 2727494

Parameter	Units	10406354006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	283	291	3	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 91652 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

METHOD BLANK: 393951 Matrix: Water  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	10/12/17 12:45	

LABORATORY CONTROL SAMPLE: 393952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	95	90-110	

MATRIX SPIKE SAMPLE: 393954

Parameter	Units	2062956001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	1.5	1	2.2	66	75-125	M1

SAMPLE DUPLICATE: 393953

Parameter	Units	2062956001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	1.5	1.5	0	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501211

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10406354001, 10406354002, 10406354003

METHOD BLANK: 2724938

Matrix: Water

Associated Lab Samples: 10406354001, 10406354002, 10406354003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	10/07/17 15:00	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	10/07/17 15:00	
Sulfate	mg/L	<0.27	1.2	0.27	10/07/17 15:00	

LABORATORY CONTROL SAMPLE: 2724939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Nitrate as N	mg/L	1	0.92	92	90-110	
Sulfate	mg/L	12.5	11.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2724940 2724941

Parameter	Units	10406354001		2724940		2724941		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	3.3	12.5	12.5	14.9	14.9	93	93	90-110	0	20		
Nitrate as N	mg/L	0.51	1	1	1.4	1.4	91	91	90-110	0	20		
Sulfate	mg/L	5.4	12.5	12.5	16.9	16.8	92	91	90-110	0	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 501489 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10406354005, 10406354006, 10406354007

METHOD BLANK: 2725912 Matrix: Water

Associated Lab Samples: 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	10/09/17 17:20	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	10/09/17 17:20	
Sulfate	mg/L	<0.27	1.2	0.27	10/09/17 17:20	

LABORATORY CONTROL SAMPLE: 2725913

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Nitrate as N	mg/L	1	0.92	92	90-110	
Sulfate	mg/L	12.5	11.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2725914 2725915

Parameter	Units	10406354005		2725914		2725915		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Chloride	mg/L	5.7	12.5	12.5	17.1	17.1	92	91	90-110	0	20		
Nitrate as N	mg/L	1.1	1	1	2.0	2.0	86	85	90-110	0	20	M1	
Sulfate	mg/L	7.7	12.5	12.5	19.0	18.9	91	90	90-110	0	20		

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 502447 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

METHOD BLANK: 2730797 Matrix: Water  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/14/17 10:35	FS

LABORATORY CONTROL SAMPLE: 2730798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730801 2730802

Parameter	Units	10406714001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	0.40	1	1	1	1.3	1.4	93	96	90-110	2	20			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730803 2730804

Parameter	Units	10406825004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	10	16.8	16.4	90	86	90-110	2	20	M6		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 502082 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

METHOD BLANK: 2729067 Matrix: Water  
 Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	10/18/17 12:40	

LABORATORY CONTROL SAMPLE: 2729068

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	296	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729069 2729070

Parameter	Units	10406328001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	21500	25000	25000	43800	43200	89	87	90-110	1	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729071 2729072

Parameter	Units	10406328002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	1190	250	250	1410	1420	89	93	90-110	1	20	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

QC Batch: 128201

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

METHOD BLANK: 509827

Matrix: Water

Associated Lab Samples: 10406354001, 10406354002, 10406354003, 10406354005, 10406354006, 10406354007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/12/17 12:48	

LABORATORY CONTROL SAMPLE: 509828

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 509829 509830

Parameter	Units	10406354001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	0.51J	25	25	26.1	26.2	102	103	80-120	0	20	

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10406354

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10406354001	MW6D-GW-100517	RSK 175	501231		
10406354002	MW4D-GW-100517	RSK 175	501231		
10406354003	MW9D-GW-100517	RSK 175	501231		
10406354005	MW20D-GW-100517	RSK 175	501485		
10406354006	MW19D-GW-100517	RSK 175	501485		
10406354007	FD-GW-100517	RSK 175	501485		
10406354001	MW6D-GW-100517	EPA 3010	502049	6010C Met	502203
10406354002	MW4D-GW-100517	EPA 3010	502049	6010C Met	502203
10406354003	MW9D-GW-100517	EPA 3010	502049	6010C Met	502203
10406354005	MW20D-GW-100517	EPA 3010	502049	6010C Met	502203
10406354006	MW19D-GW-100517	EPA 3010	502049	6010C Met	502203
10406354007	FD-GW-100517	EPA 3010	502049	6010C Met	502203
10406354001	MW6D-GW-100517	EPA 7470A	501277	EPA 7470A	501407
10406354002	MW4D-GW-100517	EPA 7470A	501277	EPA 7470A	501407
10406354003	MW9D-GW-100517	EPA 7470A	501277	EPA 7470A	501407
10406354005	MW20D-GW-100517	EPA 7470A	501789	EPA 7470A	501938
10406354006	MW19D-GW-100517	EPA 7470A	501789	EPA 7470A	501938
10406354007	FD-GW-100517	EPA 7470A	501789	EPA 7470A	501938
10406354001	MW6D-GW-100517	SM 2320B	502221		
10406354002	MW4D-GW-100517	SM 2320B	502221		
10406354003	MW9D-GW-100517	SM 2320B	502221		
10406354005	MW20D-GW-100517	SM 2320B	502221		
10406354006	MW19D-GW-100517	SM 2320B	502221		
10406354007	FD-GW-100517	SM 2320B	502221		
10406354001	MW6D-GW-100517	SM 2540C	501034		
10406354002	MW4D-GW-100517	SM 2540C	501644		
10406354003	MW9D-GW-100517	SM 2540C	501644		
10406354005	MW20D-GW-100517	SM 2540C	501818		
10406354006	MW19D-GW-100517	SM 2540C	501818		
10406354007	FD-GW-100517	SM 2540C	501818		
10406354001	MW6D-GW-100517	SM 4500-S-2 D	91652		
10406354002	MW4D-GW-100517	SM 4500-S-2 D	91652		
10406354003	MW9D-GW-100517	SM 4500-S-2 D	91652		
10406354005	MW20D-GW-100517	SM 4500-S-2 D	91652		
10406354006	MW19D-GW-100517	SM 4500-S-2 D	91652		
10406354007	FD-GW-100517	SM 4500-S-2 D	91652		
10406354001	MW6D-GW-100517	EPA 300.0	501211		
10406354002	MW4D-GW-100517	EPA 300.0	501211		
10406354003	MW9D-GW-100517	EPA 300.0	501211		
10406354005	MW20D-GW-100517	EPA 300.0	501489		
10406354006	MW19D-GW-100517	EPA 300.0	501489		
10406354007	FD-GW-100517	EPA 300.0	501489		
10406354001	MW6D-GW-100517	EPA 353.2	502447		

**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406354

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10406354002	MW4D-GW-100517	EPA 353.2	502447		
10406354003	MW9D-GW-100517	EPA 353.2	502447		
10406354005	MW20D-GW-100517	EPA 353.2	502447		
10406354006	MW19D-GW-100517	EPA 353.2	502447		
10406354007	FD-GW-100517	EPA 353.2	502447		
10406354001	MW6D-GW-100517	EPA 410.4	502082	EPA 410.4	503008
10406354002	MW4D-GW-100517	EPA 410.4	502082	EPA 410.4	503008
10406354003	MW9D-GW-100517	EPA 410.4	502082	EPA 410.4	503008
10406354005	MW20D-GW-100517	EPA 410.4	502082	EPA 410.4	503008
10406354006	MW19D-GW-100517	EPA 410.4	502082	EPA 410.4	503008
10406354007	FD-GW-100517	EPA 410.4	502082	EPA 410.4	503008
10406354001	MW6D-GW-100517	SM 5310C	128201		
10406354002	MW4D-GW-100517	SM 5310C	128201		
10406354003	MW9D-GW-100517	SM 5310C	128201		
10406354005	MW20D-GW-100517	SM 5310C	128201		
10406354006	MW19D-GW-100517	SM 5310C	128201		
10406354007	FD-GW-100517	SM 5310C	128201		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10406354

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email:		Purchase Order #: PEDD# 1497		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone:		Project Name: Freeman WA-Grain Handling Facility		Pace Quote: Contract# 758938	
Requested Due Date: 10 Day Standard		Project #: 1497		Pace Project Manager: Jennifer Gross	
				Pace Profile #: 36447 / 4	
				Regulatory Agency:	
				State / Location: WA / Freeman	

Page: 1 of 1

ITEM #	SAMPLE ID One Character per box (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	CODE	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyte, Test	Y	Requested Analysis Filtered (Y/N)	MSMSD Requested		
				START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other						
1	MW60-GW-100517	WTG	DW			10/5/17	9:35	8	4	2	1										001
2	MW4D-GW-100517		WT				11:25														002
3	MW9D-GW-100517		WW				12:40														003
4	MW20D-GW-100517		P				15:10														005
5	MW19D-GW-100517		SL				13:55														006
6	FD-GW-100517		OL				17:00														007
7			WP																		
8			AR																		
9			OT																		
10			TS																		
11																					
12																					

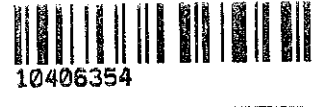
ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	CE2M	10/6/17	1600	FED EX	10/6/17	1600				
*Field filtered by client				PACE	10/7/17	9:35	3.0	Y	Y	Y
					10/9/17	9:30	4.0	Y	N	Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on top (Y/N)	Custody (Y/N)	Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	DATE Signed:					
SIGNATURE of SAMPLER:	DATE Signed:					
Steve Demus	10-5-17					

**Sample Condition Upon Receipt - ESI Tech Specs**      **Client Name:** CHZM HILL      **Project #:** **WO# : 10406354**

**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     SpeeDee     Other: \_\_\_\_\_

**Tracking Number:** 7445 1032 7935



**Custody Seal on Cooler/Box Present?**  Yes     No      **Seals Intact?**  Yes     No

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**  Yes     No

**Thermometer**  151401163      **Type of Ice:**  Wet     Blue     None     Samples on ice, cooling process has begun  
**Used:**  687A9155100842

**Cooler Temp Read (°C):** 4.2      **Cooler Temp Corrected (°C):** 4.0      **Biological Tissue Frozen?**  Yes     No     DNA  
**Temp should be above freezing to 6°C**      **Correction Factor:** -0.2      **Date and Initials of Person Examining Contents:** ET 10/9/17

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5.
<b>Short Hold Time Analysis (&lt;72 hr)?</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. <u>LIMITED HOLD TIME</u>
<b>Rush Turn Around Time Requested?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? <u>Y</u> <u>N</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dibin.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-3: 1/1</u> <u>1/1</u>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: <u>ET 10/9/17</u> Lot # of added preservative: <u>1/1</u>
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <u>SAMPLES 26 3/26/17, sample 1/3 10/9/17</u>
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1310</u>	Temp: <u>4.2</u>	Corrected Temp: <u>4.0</u>
Time: <u>1325</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS      **Date:** 10/09/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name: CH2M Hill

Project #: **WO# : 10406354**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7448-1032-7444

Custody Seal on Cooler/Box Present?  Yes  No    Seals Intact?  Yes  No    Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_    Temp Blank?  Yes  No  
 Thermometer Used:  151401163    Type of Ice:  Wet  Blue  None  Samples on Ice, cooling process has begun  
 GB7A9155100842

Cooler Temp Read (°C): 7.7    Cooler Temp Corrected (°C): 3.0    Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C    Correction Factor: -0.3    Date and Initials of Person Examining Contents: 10-7-17 JDD

USDA Regulated Soil ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. <u>Limited Hold</u>
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>Cooler missing; samples 4-6</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? <input type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA/Coliform, VOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-3</u> <u>1</u> <u>1</u> <u>1/1</u>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION    Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>10:30</u>	Temp: <u>2.2</u>	Corrected Temp: <u>3.0</u>
Time: <u>10:40</u>	put in cooler	
Time:	Temp:	Corrected Temp:

Project Manager Review: JENNI GROSS    Date: 10/09/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody

W0#: 1298563

PM: HRZ Due Date: 10/25/17  
 CLIENT: PACE MPLS



Workorder: 10406354 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 10/7/2017 Results Requested By: 10/23/2017

Report To		Subcontract To					Requested Analysis																	
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																						
						Preserved Containers																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4																		LAB USE ONLY
1	MW6D-GW-100517	PS	10/5/2017 09:35	10406354001	Water	1																		
2	MW4D-GW-100517	PS	10/5/2017 11:25	10406354002	Water	1																		
3	MW9D-GW-100517	PS	10/5/2017 12:40	10406354003	Water	1																		
4	MW20D-GW-100517	PS	10/5/2017 15:10	10406354005	Water	1																		
5	MW19D-GW-100517	PS	10/5/2017 13:55	10406354006	Water	1																		
6	FD-GW-100517	PS	10/5/2017 17:00	10406354007	Water	1																		
																						Comments		
Transfers	Released By	Date/Time	Received By	Date/Time																				
1	<i>[Signature]</i> Pace MN	10/10/17 900	<i>[Signature]</i>	10/10/17 1855																				
2	<i>[Signature]</i>	10/11/17 2300	<i>[Signature]</i>	10/11/17 0805																				
3																								
Cooler Temperature on Receipt		0.6 °C	Custody Seal	<input checked="" type="checkbox"/> or N	Received on Ice	<input checked="" type="checkbox"/> or N	Samples Intact <input checked="" type="checkbox"/> or N																	

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Paco. mlv Project #: \_\_\_\_\_

**WO#: 1298563**  
**PM: HRZ Due Date: 10/25/17**  
**CLIENT: PACE MPLS**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Hot Pack Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.3 Cooler Temp Corrected °C: 0.6 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: JJK 10/19/17

Comments: 10/16/17 JJK

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE  Y  N

TEMPERATURE WAIVER ON FILE  Y  N

Project Manager Review: [Signature] Date: 10-11-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

## WO#: 2063053



analytical®  
www.pacelabs.com

Workorder: 10406354

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 10/7/2017

Results Requested By: 10/23/2017

Report To		Subcontract To				Requested Analysis													
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333				5636267 / +500 Sulfide													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					LAB USE ONLY								
						Other													
1	MW6D-GW-100517	PS	10/5/2017 09:35	10406354001	Water	1					X								
2	MW4D-GW-100517	PS	10/5/2017 11:25	10406354002	Water	1					X								
3	MW9D-GW-100517	PS	10/5/2017 12:40	10406354003	Water	1					X								
4	MW20D-GW-100517	PS	10/5/2017 15:10	10406354005	Water	1					X								
5	MW19D-GW-100517	PS	10/5/2017 13:55	10406354006	Water	1					X								
6	FD-GW-100517	PS	10/5/2017 17:00	10406354007	Water	1					X								
Transfers											Comments								
Released By	Date/Time	Received By	Date/Time																
<i>[Signature]</i> Pace MN	10/10/17 900	<i>[Signature]</i>		<i>[Handwritten notes]</i>															
<i>[Signature]</i>	10-11-17	<i>[Signature]</i>	10-11-17																
<i>[Signature]</i>																			
Cooler Temperature on Receipt <i>10</i> °C		Custody Seal Y or N			Received on Ice Y or N			Samples Intact <i>Y</i> or N											

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Re

# WO#: 2063053

PM: CMM

Due Date: 10/23/17

CLIENT: PASI-MINN

Project: \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

**Thermometer Used:**  
 Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wal Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10-11-17 *J*

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO <sub>3</sub> _____ H <sub>2</sub> SO <sub>4</sub> _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_



October 19, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

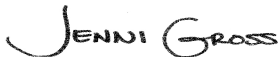
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10406438

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory between October 07, 2017 and October 09, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10406438001	MW6D-GW-100517	Water	10/05/17 09:35	10/09/17 09:30
10406438002	MW4D-GW-100517	Water	10/05/17 11:25	10/09/17 09:30
10406438003	MW9D-GW-100517	Water	10/05/17 12:40	10/09/17 09:30
10406438004	MW19D-GW-100517	Water	10/05/17 13:55	10/09/17 09:30
10406438005	MW20D-GW-100517	Water	10/05/17 15:10	10/09/17 09:30
10406438006	FD-GW-100517	Water	10/05/17 17:00	10/09/17 09:30
10406354004	Trip Blank	Water	10/05/17 00:00	10/07/17 09:35

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10406438001	MW6D-GW-100517	EPA 8260B	DJB	83	PASI-M
10406438002	MW4D-GW-100517	EPA 8260B	DJB	83	PASI-M
10406438003	MW9D-GW-100517	EPA 8260B	DJB	83	PASI-M
10406438004	MW19D-GW-100517	EPA 8260B	DJB	83	PASI-M
10406438005	MW20D-GW-100517	EPA 8260B	DJB	83	PASI-M
10406438006	FD-GW-100517	EPA 8260B	DJB	83	PASI-M
10406354004	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10406438001</b>	<b>MW6D-GW-100517</b>					
EPA 8260B	Acetone	28.4	ug/L	20.0	10/13/17 07:46	L1
EPA 8260B	Carbon tetrachloride	2.7	ug/L	0.50	10/13/17 07:46	
<b>10406438002</b>	<b>MW4D-GW-100517</b>					
EPA 8260B	Acetone	48.3	ug/L	20.0	10/13/17 08:09	L1
EPA 8260B	Carbon tetrachloride	4.4	ug/L	0.50	10/13/17 08:09	
EPA 8260B	Chloroform	1.0	ug/L	1.0	10/13/17 08:09	
<b>10406438003</b>	<b>MW9D-GW-100517</b>					
EPA 8260B	Acetone	28.2	ug/L	20.0	10/13/17 08:33	L1
EPA 8260B	Carbon tetrachloride	78.4	ug/L	0.50	10/13/17 08:33	
EPA 8260B	Chloroform	3.6	ug/L	1.0	10/13/17 08:33	
<b>10406438004</b>	<b>MW19D-GW-100517</b>					
EPA 8260B	Acetone	50.8	ug/L	40.0	10/17/17 20:03	
EPA 8260B	Carbon disulfide	0.97J	ug/L	2.0	10/17/17 20:03	
EPA 8260B	Carbon tetrachloride	329	ug/L	1.0	10/17/17 20:03	
EPA 8260B	Chloroform	18.9	ug/L	2.0	10/17/17 20:03	
EPA 8260B	Toluene	0.52J	ug/L	1.0	10/17/17 20:03	
<b>10406438005</b>	<b>MW20D-GW-100517</b>					
EPA 8260B	Acetone	24.8	ug/L	20.0	10/17/17 19:16	
EPA 8260B	Carbon tetrachloride	29.3	ug/L	0.50	10/17/17 19:16	
EPA 8260B	Chloroform	1.5	ug/L	1.0	10/17/17 19:16	
<b>10406438006</b>	<b>FD-GW-100517</b>					
EPA 8260B	Acetone	51.7	ug/L	20.0	10/17/17 19:39	
EPA 8260B	Carbon disulfide	0.89J	ug/L	1.0	10/17/17 19:39	
EPA 8260B	Carbon tetrachloride	345	ug/L	2.5	10/18/17 14:02	
EPA 8260B	Chloroform	21.7	ug/L	1.0	10/17/17 19:39	
<b>10406354004</b>	<b>Trip Blank</b>					
EPA 8260B	Chloroform	0.99J	ug/L	1.0	10/13/17 02:17	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 19, 2017

### General Information:

7 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 502264

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2729848)
- Acetone

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2729848)
- Tetrahydrofuran

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502264

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405951002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2729849)
- Acetone
- Tetrahydrofuran
- MSD (Lab ID: 2729850)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 19, 2017

QC Batch: 502264

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10405951002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- Acetone
- Tetrahydrofuran

QC Batch: 502894

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 1298516002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2733516)
  - 2,2,4-Trimethylpentane
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2733517)
  - Acetone
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10406438

Sample: **MW6D-GW-100517** Lab ID: **10406438001** Collected: 10/05/17 09:35 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 07:46	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 07:46	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 07:46	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 07:46	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:46	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:46	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 07:46	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:46	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 07:46	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 07:46	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 07:46	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 07:46	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 07:46	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 07:46	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 07:46	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 07:46	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 07:46	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 07:46	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 07:46	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 07:46	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 07:46	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 07:46	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 07:46	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 07:46	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 07:46	108-10-1	
Acetone	28.4	ug/L	20.0	8.8	1		10/13/17 07:46	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 07:46	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 07:46	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 07:46	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 07:46	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 07:46	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 07:46	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 07:46	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 07:46	75-15-0	
Carbon tetrachloride	2.7	ug/L	0.50	0.20	1		10/13/17 07:46	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 07:46	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/13/17 07:46	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 07:46	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	124-48-1	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

**Sample: MW6D-GW-100517**      **Lab ID: 10406438001**      Collected: 10/05/17 09:35      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 07:46	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 07:46	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 07:46	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 07:46	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 07:46	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 07:46	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 07:46	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 07:46	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 07:46	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 07:46	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 07:46	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 07:46	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 07:46	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 07:46	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 07:46	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 07:46	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 07:46	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 07:46	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 07:46	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 07:46	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 07:46	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 07:46	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 07:46	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 07:46	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 07:46	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 07:46	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 07:46	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 07:46	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 07:46	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	110	%	75-137		1		10/13/17 07:46	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/13/17 07:46	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1		10/13/17 07:46	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Sample: **MW4D-GW-100517** Lab ID: **10406438002** Collected: 10/05/17 11:25 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 08:09	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 08:09	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 08:09	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 08:09	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:09	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:09	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 08:09	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:09	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 08:09	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 08:09	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 08:09	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 08:09	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 08:09	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 08:09	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 08:09	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:09	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 08:09	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 08:09	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 08:09	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 08:09	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 08:09	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 08:09	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 08:09	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 08:09	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 08:09	108-10-1	
Acetone	48.3	ug/L	20.0	8.8	1		10/13/17 08:09	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 08:09	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 08:09	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 08:09	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 08:09	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 08:09	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 08:09	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 08:09	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 08:09	75-15-0	
Carbon tetrachloride	4.4	ug/L	0.50	0.20	1		10/13/17 08:09	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 08:09	75-00-3	
Chloroform	1.0	ug/L	1.0	0.46	1		10/13/17 08:09	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 08:09	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

**Sample: MW4D-GW-100517**      **Lab ID: 10406438002**      Collected: 10/05/17 11:25      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 08:09	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 08:09	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 08:09	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 08:09	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 08:09	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 08:09	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 08:09	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 08:09	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 08:09	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 08:09	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 08:09	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 08:09	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 08:09	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 08:09	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 08:09	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 08:09	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 08:09	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 08:09	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 08:09	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 08:09	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 08:09	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 08:09	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 08:09	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 08:09	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 08:09	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 08:09	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 08:09	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:09	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 08:09	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	108	%	75-137		1		10/13/17 08:09	17060-07-0	HS
Toluene-d8 (S)	101	%	75-125		1		10/13/17 08:09	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		10/13/17 08:09	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10406438

Sample: **MW9D-GW-100517** Lab ID: **10406438003** Collected: 10/05/17 12:40 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 08:33	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 08:33	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 08:33	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 08:33	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:33	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:33	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 08:33	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:33	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 08:33	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 08:33	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 08:33	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 08:33	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 08:33	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 08:33	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 08:33	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 08:33	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 08:33	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 08:33	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 08:33	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 08:33	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 08:33	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 08:33	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 08:33	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 08:33	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 08:33	108-10-1	
Acetone	28.2	ug/L	20.0	8.8	1		10/13/17 08:33	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 08:33	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 08:33	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 08:33	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 08:33	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 08:33	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 08:33	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 08:33	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 08:33	75-15-0	
Carbon tetrachloride	78.4	ug/L	0.50	0.20	1		10/13/17 08:33	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 08:33	75-00-3	
Chloroform	3.6	ug/L	1.0	0.46	1		10/13/17 08:33	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 08:33	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

**Sample: MW9D-GW-100517**      **Lab ID: 10406438003**      Collected: 10/05/17 12:40      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>									
Analytical Method: EPA 8260B									
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 08:33	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 08:33	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 08:33	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 08:33	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 08:33	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 08:33	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 08:33	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 08:33	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 08:33	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 08:33	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 08:33	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 08:33	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 08:33	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 08:33	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 08:33	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 08:33	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 08:33	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 08:33	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 08:33	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 08:33	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 08:33	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 08:33	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 08:33	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 08:33	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 08:33	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 08:33	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 08:33	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 08:33	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 08:33	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		10/13/17 08:33	17060-07-0	HS
Toluene-d8 (S)	101	%	75-125		1		10/13/17 08:33	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		10/13/17 08:33	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Sample: **MW19D-GW-100517** Lab ID: **10406438004** Collected: 10/05/17 13:55 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.29	ug/L	1.0	0.29	2		10/17/17 20:03	630-20-6	
1,1,1-Trichloroethane	<0.30	ug/L	1.0	0.30	2		10/17/17 20:03	71-55-6	
1,1,2,2-Tetrachloroethane	<0.38	ug/L	1.0	0.38	2		10/17/17 20:03	79-34-5	
1,1,2-Trichloroethane	<0.44	ug/L	1.0	0.44	2		10/17/17 20:03	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.55	ug/L	2.0	0.55	2		10/17/17 20:03	76-13-1	
1,1-Dichloroethane	<0.29	ug/L	1.0	0.29	2		10/17/17 20:03	75-34-3	
1,1-Dichloroethene	<0.36	ug/L	1.0	0.36	2		10/17/17 20:03	75-35-4	
1,1-Dichloropropene	<0.35	ug/L	1.0	0.35	2		10/17/17 20:03	563-58-6	
1,2,3-Trichlorobenzene	<0.29	ug/L	1.0	0.29	2		10/17/17 20:03	87-61-6	
1,2,3-Trichloropropane	<1.3	ug/L	8.0	1.3	2		10/17/17 20:03	96-18-4	
1,2,4-Trichlorobenzene	<0.36	ug/L	1.0	0.36	2		10/17/17 20:03	120-82-1	
1,2,4-Trimethylbenzene	<0.20	ug/L	2.0	0.20	2		10/17/17 20:03	95-63-6	
1,2-Dibromo-3-chloropropane	<2.1	ug/L	8.0	2.1	2		10/17/17 20:03	96-12-8	
1,2-Dibromoethane (EDB)	<0.34	ug/L	1.0	0.34	2		10/17/17 20:03	106-93-4	
1,2-Dichlorobenzene	<0.42	ug/L	1.0	0.42	2		10/17/17 20:03	95-50-1	
1,2-Dichloroethane	<0.30	ug/L	1.0	0.30	2		10/17/17 20:03	107-06-2	
1,2-Dichloroethene (Total)	<0.82	ug/L	2.0	0.82	2		10/17/17 20:03	540-59-0	
1,2-Dichloropropane	<1.2	ug/L	8.0	1.2	2		10/17/17 20:03	78-87-5	
1,3,5-Trimethylbenzene	<0.36	ug/L	1.0	0.36	2		10/17/17 20:03	108-67-8	
1,3-Dichlorobenzene	<0.32	ug/L	1.0	0.32	2		10/17/17 20:03	541-73-1	
1,3-Dichloropropane	<0.26	ug/L	1.0	0.26	2		10/17/17 20:03	142-28-9	
1,4-Dichlorobenzene	<0.21	ug/L	1.0	0.21	2		10/17/17 20:03	106-46-7	
1,4-Dioxane (p-Dioxane)	<45.2	ug/L	400	45.2	2		10/17/17 20:03	123-91-1	
2,2,4-Trimethylpentane	<2.6	ug/L	8.0	2.6	2		10/17/17 20:03	540-84-1	
2,2-Dichloropropane	<0.79	ug/L	2.0	0.79	2		10/17/17 20:03	594-20-7	
2-Butanone (MEK)	<4.8	ug/L	10.0	4.8	2		10/17/17 20:03	78-93-3	
2-Chlorotoluene	<0.41	ug/L	1.0	0.41	2		10/17/17 20:03	95-49-8	
2-Hexanone	<5.0	ug/L	10.0	5.0	2		10/17/17 20:03	591-78-6	
4-Chlorotoluene	<0.26	ug/L	1.0	0.26	2		10/17/17 20:03	106-43-4	
4-Methyl-2-pentanone (MIBK)	<1.1	ug/L	10.0	1.1	2		10/17/17 20:03	108-10-1	
Acetone	50.8	ug/L	40.0	17.7	2		10/17/17 20:03	67-64-1	
Acrolein	<9.7	ug/L	20.0	9.7	2		10/17/17 20:03	107-02-8	
Acrylonitrile	<9.8	ug/L	20.0	9.8	2		10/17/17 20:03	107-13-1	
Benzene	<0.25	ug/L	1.0	0.25	2		10/17/17 20:03	71-43-2	
Bromobenzene	<0.31	ug/L	1.0	0.31	2		10/17/17 20:03	108-86-1	
Bromochloromethane	<0.76	ug/L	2.0	0.76	2		10/17/17 20:03	74-97-5	
Bromodichloromethane	<0.40	ug/L	1.0	0.40	2		10/17/17 20:03	75-27-4	
Bromoform	<2.1	ug/L	8.0	2.1	2		10/17/17 20:03	75-25-2	
Bromomethane	<3.1	ug/L	8.0	3.1	2		10/17/17 20:03	74-83-9	
Carbon disulfide	0.97J	ug/L	2.0	0.74	2		10/17/17 20:03	75-15-0	
Carbon tetrachloride	329	ug/L	1.0	0.40	2		10/17/17 20:03	56-23-5	
Chlorobenzene	<0.27	ug/L	1.0	0.27	2		10/17/17 20:03	108-90-7	
Chloroethane	<0.88	ug/L	2.0	0.88	2		10/17/17 20:03	75-00-3	
Chloroform	18.9	ug/L	2.0	0.92	2		10/17/17 20:03	67-66-3	
Chloromethane	<2.2	ug/L	8.0	2.2	2		10/17/17 20:03	74-87-3	
Dibromochloromethane	<0.27	ug/L	1.0	0.27	2		10/17/17 20:03	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Sample: **MW19D-GW-100517** Lab ID: **10406438004** Collected: 10/05/17 13:55 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<1.0	ug/L	2.0	1.0	2		10/17/17 20:03	74-95-3	
Dichlorodifluoromethane	<0.63	ug/L	2.0	0.63	2		10/17/17 20:03	75-71-8	
Dichlorofluoromethane	<0.77	ug/L	2.0	0.77	2		10/17/17 20:03	75-43-4	
Diisopropyl ether	<0.25	ug/L	2.0	0.25	2		10/17/17 20:03	108-20-3	
Ethyl-tert-butyl ether	<0.26	ug/L	1.0	0.26	2		10/17/17 20:03	637-92-3	
Ethylbenzene	<0.27	ug/L	1.0	0.27	2		10/17/17 20:03	100-41-4	
Hexachloro-1,3-butadiene	<0.96	ug/L	2.0	0.96	2		10/17/17 20:03	87-68-3	
Isopropylbenzene (Cumene)	<0.28	ug/L	1.0	0.28	2		10/17/17 20:03	98-82-8	
Methyl-tert-butyl ether	<0.29	ug/L	1.0	0.29	2		10/17/17 20:03	1634-04-4	
Methylene Chloride	<2.3	ug/L	8.0	2.3	2		10/17/17 20:03	75-09-2	
Naphthalene	<0.84	ug/L	2.0	0.84	2		10/17/17 20:03	91-20-3	
Styrene	<0.29	ug/L	2.0	0.29	2		10/17/17 20:03	100-42-5	
Tetrachloroethene	<0.32	ug/L	1.0	0.32	2		10/17/17 20:03	127-18-4	
Tetrahydrofuran	<8.6	ug/L	20.0	8.6	2		10/17/17 20:03	109-99-9	
Toluene	0.52J	ug/L	1.0	0.34	2		10/17/17 20:03	108-88-3	
Trichloroethene	<0.36	ug/L	0.80	0.36	2		10/17/17 20:03	79-01-6	
Trichlorofluoromethane	<0.26	ug/L	1.0	0.26	2		10/17/17 20:03	75-69-4	
Vinyl acetate	<3.0	ug/L	20.0	3.0	2		10/17/17 20:03	108-05-4	
Vinyl chloride	<0.19	ug/L	0.40	0.19	2		10/17/17 20:03	75-01-4	
Xylene (Total)	<0.49	ug/L	3.0	0.49	2		10/17/17 20:03	1330-20-7	
cis-1,2-Dichloroethene	<0.40	ug/L	1.0	0.40	2		10/17/17 20:03	156-59-2	
cis-1,3-Dichloropropene	<0.23	ug/L	1.0	0.23	2		10/17/17 20:03	10061-01-5	
m&p-Xylene	<0.49	ug/L	2.0	0.49	2		10/17/17 20:03	179601-23-1	
n-Butylbenzene	<0.27	ug/L	1.0	0.27	2		10/17/17 20:03	104-51-8	
n-Propylbenzene	<0.25	ug/L	1.0	0.25	2		10/17/17 20:03	103-65-1	
o-Xylene	<0.22	ug/L	1.0	0.22	2		10/17/17 20:03	95-47-6	
p-Isopropyltoluene	<0.28	ug/L	2.0	0.28	2		10/17/17 20:03	99-87-6	
sec-Butylbenzene	<0.25	ug/L	1.0	0.25	2		10/17/17 20:03	135-98-8	
tert-Amylmethyl ether	<0.23	ug/L	1.0	0.23	2		10/17/17 20:03	994-05-8	
tert-Butyl Alcohol	<4.4	ug/L	20.0	4.4	2		10/17/17 20:03	75-65-0	
tert-Butylbenzene	<0.29	ug/L	1.0	0.29	2		10/17/17 20:03	98-06-6	
trans-1,2-Dichloroethene	<0.42	ug/L	1.0	0.42	2		10/17/17 20:03	156-60-5	
trans-1,3-Dichloropropene	<0.27	ug/L	1.0	0.27	2		10/17/17 20:03	10061-02-6	
trans-1,4-Dichloro-2-butene	<5.7	ug/L	20.0	5.7	2		10/17/17 20:03	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		2		10/17/17 20:03	17060-07-0	
Toluene-d8 (S)	100	%	75-125		2		10/17/17 20:03	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		2		10/17/17 20:03	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10406438

Sample: **MW20D-GW-100517** Lab ID: **10406438005** Collected: 10/05/17 15:10 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/17/17 19:16	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/17/17 19:16	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/17/17 19:16	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/17/17 19:16	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:16	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:16	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/17/17 19:16	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:16	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/17/17 19:16	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/17/17 19:16	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/17/17 19:16	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/17/17 19:16	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/17/17 19:16	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/17/17 19:16	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/17/17 19:16	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:16	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/17/17 19:16	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/17/17 19:16	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/17/17 19:16	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/17/17 19:16	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/17/17 19:16	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/17/17 19:16	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/17/17 19:16	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/17/17 19:16	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/17/17 19:16	108-10-1	
Acetone	24.8	ug/L	20.0	8.8	1		10/17/17 19:16	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/17/17 19:16	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/17/17 19:16	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/17/17 19:16	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/17/17 19:16	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/17/17 19:16	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/17/17 19:16	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/17/17 19:16	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/17/17 19:16	75-15-0	
Carbon tetrachloride	29.3	ug/L	0.50	0.20	1		10/17/17 19:16	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/17/17 19:16	75-00-3	
Chloroform	1.5	ug/L	1.0	0.46	1		10/17/17 19:16	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/17/17 19:16	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

**Sample: MW20D-GW-100517**      **Lab ID: 10406438005**      Collected: 10/05/17 15:10      Received: 10/09/17 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/17/17 19:16	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/17/17 19:16	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/17/17 19:16	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/17/17 19:16	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/17/17 19:16	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/17/17 19:16	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/17/17 19:16	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/17/17 19:16	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/17/17 19:16	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/17/17 19:16	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/17/17 19:16	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/17/17 19:16	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/17/17 19:16	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/17/17 19:16	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/17/17 19:16	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/17/17 19:16	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/17/17 19:16	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/17/17 19:16	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/17/17 19:16	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/17/17 19:16	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/17/17 19:16	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/17/17 19:16	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/17/17 19:16	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/17/17 19:16	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/17/17 19:16	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/17/17 19:16	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/17/17 19:16	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:16	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/17/17 19:16	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		10/17/17 19:16	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/17/17 19:16	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/17/17 19:16	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Sample: **FD-GW-100517** Lab ID: **10406438006** Collected: 10/05/17 17:00 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/17/17 19:39	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/17/17 19:39	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/17/17 19:39	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/17/17 19:39	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:39	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:39	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/17/17 19:39	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:39	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/17/17 19:39	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/17/17 19:39	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/17/17 19:39	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/17/17 19:39	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/17/17 19:39	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/17/17 19:39	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/17/17 19:39	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/17/17 19:39	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/17/17 19:39	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/17/17 19:39	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/17/17 19:39	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/17/17 19:39	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/17/17 19:39	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/17/17 19:39	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/17/17 19:39	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/17/17 19:39	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/17/17 19:39	108-10-1	
Acetone	51.7	ug/L	20.0	8.8	1		10/17/17 19:39	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/17/17 19:39	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/17/17 19:39	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/17/17 19:39	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/17/17 19:39	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/17/17 19:39	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/17/17 19:39	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/17/17 19:39	74-83-9	
Carbon disulfide	0.89J	ug/L	1.0	0.37	1		10/17/17 19:39	75-15-0	
Carbon tetrachloride	345	ug/L	2.5	1.0	5		10/18/17 14:02	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/17/17 19:39	75-00-3	
Chloroform	21.7	ug/L	1.0	0.46	1		10/17/17 19:39	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/17/17 19:39	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Sample: **FD-GW-100517** Lab ID: **10406438006** Collected: 10/05/17 17:00 Received: 10/09/17 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/17/17 19:39	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/17/17 19:39	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/17/17 19:39	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/17/17 19:39	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/17/17 19:39	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/17/17 19:39	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/17/17 19:39	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/17/17 19:39	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/17/17 19:39	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/17/17 19:39	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/17/17 19:39	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/17/17 19:39	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/17/17 19:39	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/17/17 19:39	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/17/17 19:39	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/17/17 19:39	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/17/17 19:39	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/17/17 19:39	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/17/17 19:39	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/17/17 19:39	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/17/17 19:39	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/17/17 19:39	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/17/17 19:39	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/17/17 19:39	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/17/17 19:39	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/17/17 19:39	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/17/17 19:39	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/17/17 19:39	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/17/17 19:39	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		10/17/17 19:39	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/17/17 19:39	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/17/17 19:39	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10406438

**Sample: Trip Blank**      **Lab ID: 10406354004**      Collected: 10/05/17 00:00      Received: 10/07/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 02:17	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/13/17 02:17	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/13/17 02:17	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/13/17 02:17	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/13/17 02:17	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/13/17 02:17	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/13/17 02:17	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 02:17	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/13/17 02:17	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/13/17 02:17	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/13/17 02:17	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/13/17 02:17	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/13/17 02:17	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/13/17 02:17	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/13/17 02:17	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/13/17 02:17	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 02:17	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/13/17 02:17	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/13/17 02:17	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/13/17 02:17	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/13/17 02:17	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/13/17 02:17	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/13/17 02:17	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/13/17 02:17	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/13/17 02:17	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		10/13/17 02:17	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/13/17 02:17	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/13/17 02:17	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/13/17 02:17	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 02:17	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/13/17 02:17	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/13/17 02:17	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/13/17 02:17	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/13/17 02:17	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/13/17 02:17	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/13/17 02:17	75-00-3	
Chloroform	0.99J	ug/L	1.0	0.46	1		10/13/17 02:17	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/13/17 02:17	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

**Sample: Trip Blank**      **Lab ID: 10406354004**      Collected: 10/05/17 00:00      Received: 10/07/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/13/17 02:17	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/13/17 02:17	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/13/17 02:17	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/13/17 02:17	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/13/17 02:17	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/13/17 02:17	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/13/17 02:17	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/13/17 02:17	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/13/17 02:17	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/13/17 02:17	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/13/17 02:17	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/13/17 02:17	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/13/17 02:17	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/13/17 02:17	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/13/17 02:17	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/13/17 02:17	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/13/17 02:17	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/13/17 02:17	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/13/17 02:17	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 02:17	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/13/17 02:17	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/13/17 02:17	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/13/17 02:17	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/13/17 02:17	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/13/17 02:17	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/13/17 02:17	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/13/17 02:17	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/13/17 02:17	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/13/17 02:17	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		10/13/17 02:17	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/13/17 02:17	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/13/17 02:17	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

QC Batch: 502264 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10406354004, 10406438001, 10406438002, 10406438003

METHOD BLANK: 2729847 Matrix: Water  
Associated Lab Samples: 10406354004, 10406438001, 10406438002, 10406438003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/13/17 00:44	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/13/17 00:44	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/13/17 00:44	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/13/17 00:44	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/13/17 00:44	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	10/13/17 00:44	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/13/17 00:44	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/13/17 00:44	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/13/17 00:44	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/13/17 00:44	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/13/17 00:44	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/13/17 00:44	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/13/17 00:44	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/13/17 00:44	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/13/17 00:44	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/13/17 00:44	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/13/17 00:44	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/13/17 00:44	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/13/17 00:44	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/13/17 00:44	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/13/17 00:44	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/13/17 00:44	
Acetone	ug/L	<8.8	20.0	8.8	10/13/17 00:44	
Acrolein	ug/L	<4.8	10.0	4.8	10/13/17 00:44	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/13/17 00:44	
Benzene	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/13/17 00:44	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/13/17 00:44	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/13/17 00:44	
Bromoform	ug/L	<1.0	4.0	1.0	10/13/17 00:44	
Bromomethane	ug/L	<1.5	4.0	1.5	10/13/17 00:44	
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/13/17 00:44	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/13/17 00:44	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

METHOD BLANK: 2729847

Matrix: Water

Associated Lab Samples: 10406354004, 10406438001, 10406438002, 10406438003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
Chloroethane	ug/L	<0.44	1.0	0.44	10/13/17 00:44	
Chloroform	ug/L	<0.46	1.0	0.46	10/13/17 00:44	
Chloromethane	ug/L	<1.1	4.0	1.1	10/13/17 00:44	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/13/17 00:44	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/13/17 00:44	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/13/17 00:44	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/13/17 00:44	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/13/17 00:44	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/13/17 00:44	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/13/17 00:44	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/13/17 00:44	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
Naphthalene	ug/L	<0.42	1.0	0.42	10/13/17 00:44	
o-Xylene	ug/L	<0.11	0.50	0.11	10/13/17 00:44	
p-Isopropyltoluene	ug/L	<0.14	1.0	0.14	10/13/17 00:44	MN
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
Styrene	ug/L	<0.14	1.0	0.14	10/13/17 00:44	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/13/17 00:44	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/13/17 00:44	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/13/17 00:44	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/13/17 00:44	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/13/17 00:44	
Toluene	ug/L	<0.17	0.50	0.17	10/13/17 00:44	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/13/17 00:44	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	10/13/17 00:44	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/13/17 00:44	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/13/17 00:44	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/13/17 00:44	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/13/17 00:44	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/13/17 00:44	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/13/17 00:44	
1,2-Dichloroethane-d4 (S)	%	104	75-137		10/13/17 00:44	
4-Bromofluorobenzene (S)	%	101	75-125		10/13/17 00:44	
Toluene-d8 (S)	%	102	75-125		10/13/17 00:44	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

LABORATORY CONTROL SAMPLE: 2729848

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.3	101	75-136	
1,1,1-Trichloroethane	ug/L	20	20.3	102	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	21.5	107	71-138	
1,1,2-Trichloroethane	ug/L	20	20.2	101	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.0	95	69-126	
1,1-Dichloroethane	ug/L	20	19.8	99	75-125	
1,1-Dichloroethene	ug/L	20	19.3	97	75-125	
1,1-Dichloropropene	ug/L	20	20.0	100	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.5	102	75-125	
1,2,3-Trichloropropane	ug/L	20	20.9	105	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.4	97	75-125	
1,2,4-Trimethylbenzene	ug/L	20	18.8	94	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	52.6	105	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	22.3	112	75-125	
1,2-Dichlorobenzene	ug/L	20	20.8	104	75-125	
1,2-Dichloroethane	ug/L	20	18.1	91	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.8	95	75-125	
1,2-Dichloropropane	ug/L	20	20.3	102	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3-Dichlorobenzene	ug/L	20	19.0	95	75-125	
1,3-Dichloropropane	ug/L	20	21.6	108	75-125	
1,4-Dichlorobenzene	ug/L	20	20.2	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	368	92	64-140	
2,2,4-Trimethylpentane	ug/L	20	17.6	88	68-125	
2,2-Dichloropropane	ug/L	20	18.5	92	70-131	
2-Butanone (MEK)	ug/L	100	103	103	69-125	
2-Chlorotoluene	ug/L	20	20.0	100	75-125	
2-Hexanone	ug/L	100	118	118	73-129	
4-Chlorotoluene	ug/L	20	20.6	103	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	115	115	73-125	
Acetone	ug/L	100	136	136	66-126 L1	
Acrolein	ug/L	200	199	99	56-150	
Acrylonitrile	ug/L	200	203	102	68-129	
Benzene	ug/L	20	20.4	102	75-125	
Bromobenzene	ug/L	20	20.3	102	75-125	
Bromochloromethane	ug/L	20	19.9	99	75-126	
Bromodichloromethane	ug/L	20	20.1	101	75-133	
Bromoform	ug/L	20	18.9	94	62-142	
Bromomethane	ug/L	20	17.4	87	34-143	
Carbon disulfide	ug/L	20	18.4	92	71-125	
Carbon tetrachloride	ug/L	20	19.8	99	71-145	
Chlorobenzene	ug/L	20	21.4	107	75-125	
Chloroethane	ug/L	20	17.8	89	75-125	
Chloroform	ug/L	20	18.3	92	75-125	
Chloromethane	ug/L	20	19.0	95	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.7	93	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

LABORATORY CONTROL SAMPLE: 2729848

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	20.6	103	74-141	
Dibromomethane	ug/L	20	20.5	103	75-125	
Dichlorodifluoromethane	ug/L	20	18.7	93	59-130	
Dichlorofluoromethane	ug/L	20	19.2	96	75-125	
Diisopropyl ether	ug/L	20	18.5	93	69-125	
Ethyl-tert-butyl ether	ug/L	20	19.2	96	73-125	
Ethylbenzene	ug/L	20	21.0	105	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.6	108	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.7	98	75-125	
m&p-Xylene	ug/L	40	39.6	99	75-125	
Methyl-tert-butyl ether	ug/L	20	18.4	92	75-125	
Methylene Chloride	ug/L	20	17.7	89	73-125	
n-Butylbenzene	ug/L	20	19.6	98	75-125	
n-Propylbenzene	ug/L	20	20.8	104	75-125	
Naphthalene	ug/L	20	19.1	95	74-125	
o-Xylene	ug/L	20	21.0	105	75-125	
p-Isopropyltoluene	ug/L	20	19.1	95	75-125	
sec-Butylbenzene	ug/L	20	19.5	97	75-125	
Styrene	ug/L	20	19.4	97	75-125	
tert-Amylmethyl ether	ug/L	20	19.5	98	71-126	
tert-Butyl Alcohol	ug/L	200	195	98	69-131	
tert-Butylbenzene	ug/L	20	20.5	102	75-125	
Tetrachloroethene	ug/L	20	21.9	110	75-125	
Tetrahydrofuran	ug/L	200	265	133	65-127 L3	
Toluene	ug/L	20	19.5	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.5	98	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	46.8	94	30-150	
Trichloroethene	ug/L	20	20.1	100	75-125	
Trichlorofluoromethane	ug/L	20	19.2	96	71-140	
Vinyl acetate	ug/L	20	18.6	93	68-137	
Vinyl chloride	ug/L	20	20.9	105	70-125	
Xylene (Total)	ug/L	60	60.6	101	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			97	75-125	
Toluene-d8 (S)	%			103	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729849 2729850

Parameter	Units	2729849		2729850		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10405951002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.50	20	20	21.3	19.6	106	98	75-137	8	30
1,1,1-Trichloroethane	ug/L	<0.50	20	20	22.7	19.9	113	100	75-139	13	30
1,1,2,2-Tetrachloroethane	ug/L	<0.50	20	20	22.2	20.8	111	104	60-142	7	30
1,1,2-Trichloroethane	ug/L	<0.50	20	20	20.9	18.7	105	94	75-128	11	30

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Parameter	Units	10405951002		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec							
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729849																
1,1,2-Trichlorotrifluoroethane	ug/L	<1.0	20	20	21.7	20.1	109	100	62-150	8	30					
1,1-Dichloroethane	ug/L	<0.50	20	20	21.6	19.6	108	98	70-129	10	30					
1,1-Dichloroethene	ug/L	<0.50	20	20	21.1	19.8	106	99	67-141	7	30					
1,1-Dichloropropene	ug/L	<0.50	20	20	21.7	20.4	109	102	64-144	6	30					
1,2,3-Trichlorobenzene	ug/L	<0.50	20	20	24.1	23.8	121	119	66-139	1	30					
1,2,3-Trichloropropane	ug/L	<4.0	20	20	21.3	20.1	107	100	69-134	6	30					
1,2,4-Trichlorobenzene	ug/L	<0.50	20	20	22.5	21.3	113	106	65-138	6	30					
1,2,4-Trimethylbenzene	ug/L	<1.0	20	20	20.1	18.3	100	91	65-143	9	30					
1,2-Dibromo-3-chloropropane	ug/L	<4.0	50	50	58.3	54.2	117	108	61-134	7	30					
1,2-Dibromoethane (EDB)	ug/L	<0.50	20	20	22.5	20.4	113	102	74-129	10	30					
1,2-Dichlorobenzene	ug/L	<0.50	20	20	22.2	20.3	111	102	68-135	9	30					
1,2-Dichloroethane	ug/L	<0.50	20	20	19.4	17.6	97	88	73-125	10	30					
1,2-Dichloroethene (Total)	ug/L	<1.0	40	40	40.7	37.7	102	94	69-134	8	30					
1,2-Dichloropropane	ug/L	<4.0	20	20	21.3	19.3	106	97	64-130	10	30					
1,3,5-Trimethylbenzene	ug/L	<0.50	20	20	22.2	20.4	111	102	64-146	9	30					
1,3-Dichlorobenzene	ug/L	<0.50	20	20	21.2	19.4	106	97	69-135	8	30					
1,3-Dichloropropane	ug/L	<0.50	20	20	22.6	20.2	113	101	67-128	11	30					
1,4-Dichlorobenzene	ug/L	<0.50	20	20	22.4	20.2	112	101	66-134	10	30					
1,4-Dioxane (p-Dioxane)	ug/L	<200	400	400	370	365	92	91	58-140	1	30					
2,2,4-Trimethylpentane	ug/L	<4.0	20	20	20.5	18.6	102	93	48-150	10	30					
2,2-Dichloropropane	ug/L	<1.0	20	20	20.3	18.6	101	93	50-150	9	30					
2-Butanone (MEK)	ug/L	<5.0	100	100	97.5	92.3	98	92	58-125	5	30					
2-Chlorotoluene	ug/L	<0.50	20	20	21.6	20.0	108	100	65-138	7	30					
2-Hexanone	ug/L	<5.0	100	100	119	109	119	109	61-134	9	30					
4-Chlorotoluene	ug/L	<0.50	20	20	22.3	20.4	111	102	68-135	9	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	100	100	118	108	118	108	61-130	9	30					
Acetone	ug/L	<20.0	100	100	191	171	191	171	51-140	11	30	MO				
Acrolein	ug/L	<10.0	200	200	204	180	102	90	48-150	12	30					
Acrylonitrile	ug/L	<10.0	200	200	209	189	105	95	55-134	10	30					
Benzene	ug/L	<0.50	20	20	21.6	20.0	108	100	63-132	7	30					
Bromobenzene	ug/L	<0.50	20	20	21.6	20.4	108	102	67-138	6	30					
Bromochloromethane	ug/L	<1.0	20	20	21.3	19.3	107	96	66-138	10	30					
Bromodichloromethane	ug/L	0.55	20	20	22.3	19.9	109	97	75-137	11	30					
Bromoform	ug/L	<4.0	20	20	21.1	18.8	105	94	65-129	11	30					
Bromomethane	ug/L	<4.0	20	20	18.0	19.2	90	96	41-150	6	30					
Carbon disulfide	ug/L	<1.0	20	20	20.0	18.5	100	93	72-132	8	30					
Carbon tetrachloride	ug/L	<0.50	20	20	21.5	19.9	108	99	75-150	8	30					
Chlorobenzene	ug/L	<0.50	20	20	22.3	20.4	111	102	73-127	9	30					
Chloroethane	ug/L	<1.0	20	20	16.6	17.8	83	89	74-138	7	30					
Chloroform	ug/L	6.7	20	20	25.5	23.6	94	84	74-125	8	30					
Chloromethane	ug/L	<4.0	20	20	18.5	19.5	92	97	58-129	5	30					
cis-1,2-Dichloroethene	ug/L	<0.50	20	20	20.4	18.7	102	94	63-135	9	30					
cis-1,3-Dichloropropene	ug/L	<0.50	20	20	18.5	16.4	92	82	66-129	12	30					
Dibromochloromethane	ug/L	<0.50	20	20	22.4	20.2	112	101	75-133	10	30					

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Parameter	Units	10405951002		2729849		2729850		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<1.0	20	20	21.4	19.1	107	96	68-134	11	30		
Dichlorodifluoromethane	ug/L	<1.0	20	20	19.5	20.8	97	104	72-150	7	30		
Dichlorofluoromethane	ug/L	<1.0	20	20	18.4	19.9	92	100	75-129	8	30		
Diisopropyl ether	ug/L	<1.0	20	20	19.5	17.9	97	89	62-128	9	30		
Ethyl-tert-butyl ether	ug/L	<0.50	20	20	20.3	18.4	101	92	63-132	9	30		
Ethylbenzene	ug/L	<0.50	20	20	22.5	20.7	113	104	72-130	8	30		
Hexachloro-1,3-butadiene	ug/L	<1.0	20	20	24.1	21.3	120	107	71-150	12	30		
Isopropylbenzene (Cumene)	ug/L	<0.50	20	20	20.9	19.5	105	98	70-136	7	30		
m&p-Xylene	ug/L	<1.0	40	40	41.6	38.4	104	96	64-142	8	30		
Methyl-tert-butyl ether	ug/L	<0.50	20	20	19.3	17.9	96	89	72-125	8	30		
Methylene Chloride	ug/L	<4.0	20	20	19.1	16.9	96	85	60-132	12	30		
n-Butylbenzene	ug/L	<0.50	20	20	21.7	19.6	109	98	60-150	10	30		
n-Propylbenzene	ug/L	<0.50	20	20	22.4	20.8	112	104	63-142	7	30		
Naphthalene	ug/L	<1.0	20	20	23.4	23.1	117	116	67-125	1	30		
o-Xylene	ug/L	<0.50	20	20	21.9	20.5	109	103	60-143	7	30		
p-Isopropyltoluene	ug/L	<1.0	20	20	20.5	18.6	103	93	64-146	10	30		
sec-Butylbenzene	ug/L	<0.50	20	20	21.5	19.9	107	99	67-144	8	30		
Styrene	ug/L	<1.0	20	20	20.0	18.2	100	91	67-136	10	30		
tert-Amylmethyl ether	ug/L	<0.50	20	20	20.5	18.7	102	94	60-134	9	30		
tert-Butyl Alcohol	ug/L	<10.0	200	200	208	184	104	92	56-146	12	30		
tert-Butylbenzene	ug/L	<0.50	20	20	22.1	20.6	111	103	68-135	7	30		
Tetrachloroethene	ug/L	<0.50	20	20	23.2	21.9	116	109	67-148	6	30		
Tetrahydrofuran	ug/L	<10.0	200	200	382	330	191	165	51-141	15	30	MO	
Toluene	ug/L	<0.50	20	20	20.4	18.7	102	94	61-140	8	30		
trans-1,2-Dichloroethene	ug/L	<0.50	20	20	20.3	19.0	102	95	62-138	7	30		
trans-1,3-Dichloropropene	ug/L	<0.50	20	20	20.5	18.8	103	94	67-134	9	30		
trans-1,4-Dichloro-2-butene	ug/L	<10.0	50	50	49.9	44.4	100	89	30-150	12	30		
Trichloroethene	ug/L	9.3	20	20	31.0	29.1	108	99	64-149	6	30		
Trichlorofluoromethane	ug/L	<0.50	20	20	19.3	21.2	97	106	75-150	9	30		
Vinyl acetate	ug/L	<10.0	20	20	17.5	15.9	88	80	49-143	10	30		
Vinyl chloride	ug/L	ND	20	20	20.4	22.1	102	111	75-133	8	30		
Xylene (Total)	ug/L	<1.5	60	60	63.5	58.9	106	98	63-142	8	30		
1,2-Dichloroethane-d4 (S)	%						98	100	75-137				
4-Bromofluorobenzene (S)	%						103	104	75-125				
Toluene-d8 (S)	%						103	100	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

QC Batch: 502894 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10406438004, 10406438005, 10406438006

METHOD BLANK: 2733514 Matrix: Water

Associated Lab Samples: 10406438004, 10406438005, 10406438006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/17/17 12:13	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/17/17 12:13	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/17/17 12:13	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/17/17 12:13	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/17/17 12:13	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/17/17 12:13	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/17/17 12:13	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/17/17 12:13	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	10/17/17 12:13	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/17/17 12:13	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/17/17 12:13	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/17/17 12:13	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/17/17 12:13	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/17/17 12:13	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/17/17 12:13	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/17/17 12:13	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/17/17 12:13	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/17/17 12:13	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/17/17 12:13	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/17/17 12:13	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/17/17 12:13	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/17/17 12:13	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/17/17 12:13	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/17/17 12:13	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/17/17 12:13	
Acetone	ug/L	<8.8	20.0	8.8	10/17/17 12:13	
Acrolein	ug/L	<4.8	10.0	4.8	10/17/17 12:13	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/17/17 12:13	
Benzene	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/17/17 12:13	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/17/17 12:13	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/17/17 12:13	
Bromoform	ug/L	<1.0	4.0	1.0	10/17/17 12:13	
Bromomethane	ug/L	<1.5	4.0	1.5	10/17/17 12:13	
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/17/17 12:13	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/17/17 12:13	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

METHOD BLANK: 2733514

Matrix: Water

Associated Lab Samples: 10406438004, 10406438005, 10406438006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
Chloroethane	ug/L	<0.44	1.0	0.44	10/17/17 12:13	
Chloroform	ug/L	<0.46	1.0	0.46	10/17/17 12:13	
Chloromethane	ug/L	<1.1	4.0	1.1	10/17/17 12:13	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/17/17 12:13	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	10/17/17 12:13	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/17/17 12:13	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/17/17 12:13	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/17/17 12:13	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/17/17 12:13	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/17/17 12:13	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/17/17 12:13	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/17/17 12:13	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/17/17 12:13	
Naphthalene	ug/L	<0.42	1.0	0.42	10/17/17 12:13	
o-Xylene	ug/L	<0.11	0.50	0.11	10/17/17 12:13	
p-Isopropyltoluene	ug/L	<0.14	1.0	0.14	10/17/17 12:13	MN
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/17/17 12:13	
Styrene	ug/L	<0.14	1.0	0.14	10/17/17 12:13	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/17/17 12:13	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/17/17 12:13	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/17/17 12:13	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/17/17 12:13	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/17/17 12:13	
Toluene	ug/L	<0.17	0.50	0.17	10/17/17 12:13	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/17/17 12:13	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	10/17/17 12:13	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/17/17 12:13	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/17/17 12:13	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/17/17 12:13	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/17/17 12:13	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/17/17 12:13	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/17/17 12:13	
1,2-Dichloroethane-d4 (S)	%	103	75-137		10/17/17 12:13	
4-Bromofluorobenzene (S)	%	103	75-125		10/17/17 12:13	
Toluene-d8 (S)	%	101	75-125		10/17/17 12:13	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

LABORATORY CONTROL SAMPLE: 2733515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.9	99	75-136	
1,1,1-Trichloroethane	ug/L	20	20.6	103	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.1	100	71-138	
1,1,2-Trichloroethane	ug/L	20	19.5	98	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.9	95	69-126	
1,1-Dichloroethane	ug/L	20	20.3	101	75-125	
1,1-Dichloroethene	ug/L	20	19.0	95	75-125	
1,1-Dichloropropene	ug/L	20	20.6	103	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.8	104	75-125	
1,2,3-Trichloropropane	ug/L	20	20.0	100	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.8	104	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.5	98	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	50.5	101	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.1	105	75-125	
1,2-Dichlorobenzene	ug/L	20	20.7	104	75-125	
1,2-Dichloroethane	ug/L	20	19.1	95	70-125	
1,2-Dichloroethene (Total)	ug/L	40	38.9	97	75-125	
1,2-Dichloropropane	ug/L	20	20.6	103	75-125	
1,3,5-Trimethylbenzene	ug/L	20	21.1	105	75-125	
1,3-Dichlorobenzene	ug/L	20	19.7	99	75-125	
1,3-Dichloropropane	ug/L	20	21.0	105	75-125	
1,4-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	374	93	64-140	
2,2,4-Trimethylpentane	ug/L	20	21.7	109	68-125	
2,2-Dichloropropane	ug/L	20	21.2	106	70-131	
2-Butanone (MEK)	ug/L	100	96.6	97	69-125	
2-Chlorotoluene	ug/L	20	20.2	101	75-125	
2-Hexanone	ug/L	100	109	109	73-129	
4-Chlorotoluene	ug/L	20	21.2	106	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	109	109	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	201	100	56-150	
Acrylonitrile	ug/L	200	204	102	68-129	
Benzene	ug/L	20	20.9	105	75-125	
Bromobenzene	ug/L	20	20.2	101	75-125	
Bromochloromethane	ug/L	20	19.4	97	75-126	
Bromodichloromethane	ug/L	20	20.5	103	75-133	
Bromoform	ug/L	20	19.0	95	62-142	
Bromomethane	ug/L	20	15.8	79	34-143	
Carbon disulfide	ug/L	20	18.7	93	71-125	
Carbon tetrachloride	ug/L	20	19.5	98	71-145	
Chlorobenzene	ug/L	20	20.7	104	75-125	
Chloroethane	ug/L	20	17.9	90	75-125	
Chloroform	ug/L	20	19.0	95	75-125	
Chloromethane	ug/L	20	17.9	89	54-125	
cis-1,2-Dichloroethene	ug/L	20	19.7	98	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

LABORATORY CONTROL SAMPLE: 2733515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	20.6	103	74-141	
Dibromomethane	ug/L	20	20.0	100	75-125	
Dichlorodifluoromethane	ug/L	20	18.6	93	59-130	
Dichlorofluoromethane	ug/L	20	20.3	102	75-125	
Diisopropyl ether	ug/L	20	19.2	96	69-125	
Ethyl-tert-butyl ether	ug/L	20	20.4	102	73-125	
Ethylbenzene	ug/L	20	21.3	106	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.5	113	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.1	101	75-125	
m&p-Xylene	ug/L	40	39.0	97	75-125	
Methyl-tert-butyl ether	ug/L	20	19.0	95	75-125	
Methylene Chloride	ug/L	20	19.7	99	73-125	
n-Butylbenzene	ug/L	20	21.9	109	75-125	
n-Propylbenzene	ug/L	20	21.5	107	75-125	
Naphthalene	ug/L	20	20.3	101	74-125	
o-Xylene	ug/L	20	21.0	105	75-125	
p-Isopropyltoluene	ug/L	20	19.4	97	75-125	
sec-Butylbenzene	ug/L	20	20.4	102	75-125	
Styrene	ug/L	20	19.6	98	75-125	
tert-Amylmethyl ether	ug/L	20	20.4	102	71-126	
tert-Butyl Alcohol	ug/L	200	202	101	69-131	
tert-Butylbenzene	ug/L	20	20.9	104	75-125	
Tetrachloroethene	ug/L	20	20.3	101	75-125	
Tetrahydrofuran	ug/L	200	221	110	65-127	
Toluene	ug/L	20	19.5	98	75-125	
trans-1,2-Dichloroethene	ug/L	20	19.2	96	75-125	
trans-1,3-Dichloropropene	ug/L	20	20.0	100	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	50.9	102	30-150	
Trichloroethene	ug/L	20	19.2	96	75-125	
Trichlorofluoromethane	ug/L	20	19.5	97	71-140	
Vinyl acetate	ug/L	20	18.6	93	68-137	
Vinyl chloride	ug/L	20	20.6	103	70-125	
Xylene (Total)	ug/L	60	60.0	100	75-125	
1,2-Dichloroethane-d4 (S)	%			101	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			104	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2733516 2733517

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		1298516002 Result	Spike Conc.	Spike Conc.	MSD Result								
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	19.8	17.9	99	90	75-137	10	30		
1,1,1-Trichloroethane	ug/L	ND	20	20	23.6	21.3	118	106	75-139	10	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	20.7	18.3	103	91	60-142	12	30		
1,1,2-Trichloroethane	ug/L	ND	20	20	19.4	17.7	97	88	75-128	10	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2733516		2733517									
Parameter	Units	1298516002	MS	MSD	MS	MSD	MS	MSD	% Rec	Max			Qual
		Result	Spike	Spike	Result	Result	% Rec	% Rec	Limits	RPD	RPD		
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	23.6	21.0	118	105	62-150	11	30		
1,1-Dichloroethane	ug/L	ND	20	20	22.3	19.8	111	99	70-129	12	30		
1,1-Dichloroethene	ug/L	ND	20	20	22.6	20.1	113	101	67-141	12	30		
1,1-Dichloropropene	ug/L	ND	20	20	23.8	19.9	119	100	64-144	18	30		
1,2,3-Trichlorobenzene	ug/L	ND	20	20	24.3	23.0	121	115	66-139	5	30		
1,2,3-Trichloropropane	ug/L	ND	20	20	20.9	17.9	105	89	69-134	16	30		
1,2,4-Trichlorobenzene	ug/L	ND	20	20	23.6	20.9	118	105	65-138	12	30		
1,2,4-Trimethylbenzene	ug/L	ND	20	20	21.4	18.2	107	91	65-143	16	30		
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	52.0	48.0	104	96	61-134	8	30		
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	20.5	18.4	103	92	74-129	11	30		
1,2-Dichlorobenzene	ug/L	ND	20	20	21.4	19.1	107	95	68-135	12	30		
1,2-Dichloroethane	ug/L	ND	20	20	19.9	17.1	99	86	73-125	15	30		
1,2-Dichloroethene (Total)	ug/L	ND	40	40	44.1	38.1	110	95	69-134	14	30		
1,2-Dichloropropane	ug/L	ND	20	20	21.5	19.2	108	96	64-130	11	30		
1,3,5-Trimethylbenzene	ug/L	ND	20	20	23.5	19.6	118	98	64-146	18	30		
1,3-Dichlorobenzene	ug/L	ND	20	20	21.2	18.0	106	90	69-135	16	30		
1,3-Dichloropropane	ug/L	ND	20	20	21.1	19.0	105	95	67-128	10	30		
1,4-Dichlorobenzene	ug/L	ND	20	20	22.2	18.9	111	95	66-134	16	30		
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	426	337	107	84	58-140	23	30		
2,2,4-Trimethylpentane	ug/L	ND	20	20	31.2	23.0	156	115	48-150	30	30	M1	
2,2-Dichloropropane	ug/L	ND	20	20	24.3	21.1	121	105	50-150	14	30		
2-Butanone (MEK)	ug/L	ND	100	100	95.7	82.3	96	82	58-125	15	30		
2-Chlorotoluene	ug/L	ND	20	20	22.3	18.8	111	94	65-138	17	30		
2-Hexanone	ug/L	ND	100	100	102	96.6	102	97	61-134	6	30		
4-Chlorotoluene	ug/L	ND	20	20	22.7	19.5	114	97	68-135	15	30		
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	103	95.3	103	95	61-130	7	30		
Acetone	ug/L	ND	100	100	182	165	182	165	51-140	10	30	M1	
Acrolein	ug/L	ND	200	200	209	193	104	97	48-150	8	30		
Acrylonitrile	ug/L	ND	200	200	196	183	98	91	55-134	7	30		
Benzene	ug/L	ND	20	20	23.5	19.6	118	98	63-132	18	30		
Bromobenzene	ug/L	ND	20	20	21.0	18.2	105	91	67-138	14	30		
Bromochloromethane	ug/L	ND	20	20	21.2	18.9	106	94	66-138	12	30		
Bromodichloromethane	ug/L	ND	20	20	22.0	19.2	110	96	75-137	14	30		
Bromoform	ug/L	ND	20	20	19.3	17.9	97	89	65-129	8	30		
Bromomethane	ug/L	ND	20	20	21.5	21.5	108	107	41-150	0	30		
Carbon disulfide	ug/L	ND	20	20	22.6	19.4	113	97	72-132	15	30		
Carbon tetrachloride	ug/L	ND	20	20	22.9	20.2	115	101	75-150	13	30		
Chlorobenzene	ug/L	ND	20	20	21.3	19.3	106	96	73-127	10	30		
Chloroethane	ug/L	ND	20	20	21.2	20.8	106	104	74-138	2	30		
Chloroform	ug/L	ND	20	20	20.8	18.2	104	91	74-125	13	30		
Chloromethane	ug/L	ND	20	20	21.1	21.5	106	107	58-129	2	30		
cis-1,2-Dichloroethene	ug/L	ND	20	20	21.6	19.2	108	96	63-135	12	30		
cis-1,3-Dichloropropene	ug/L	ND	20	20	19.8	17.2	99	86	66-129	14	30		
Dibromochloromethane	ug/L	ND	20	20	20.6	18.5	103	92	75-133	11	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2733516		2733517									
Parameter	Units	1298516002	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Dibromomethane	ug/L	ND	20	20	19.3	18.3	96	92	68-134	5	30		
Dichlorodifluoromethane	ug/L	ND	20	20	25.2	23.9	126	120	72-150	5	30		
Dichlorofluoromethane	ug/L	ND	20	20	24.0	23.5	120	118	75-129	2	30		
Diisopropyl ether	ug/L	ND	20	20	20.4	17.5	102	87	62-128	15	30		
Ethyl-tert-butyl ether	ug/L	ND	20	20	20.9	17.9	105	89	63-132	16	30		
Ethylbenzene	ug/L	ND	20	20	22.6	19.7	113	99	72-130	14	30		
Hexachloro-1,3-butadiene	ug/L	ND	20	20	29.0	22.9	145	114	71-150	24	30		
Isopropylbenzene (Cumene)	ug/L	ND	20	20	21.3	19.1	106	95	70-136	11	30		
m&p-Xylene	ug/L	ND	40	40	41.7	37.0	104	92	64-142	12	30		
Methyl-tert-butyl ether	ug/L	ND	20	20	19.5	17.0	97	85	72-125	13	30		
Methylene Chloride	ug/L	ND	20	20	20.5	18.1	103	91	60-132	13	30		
n-Butylbenzene	ug/L	ND	20	20	25.7	21.6	128	108	60-150	17	30		
n-Propylbenzene	ug/L	ND	20	20	24.1	20.0	120	100	63-142	18	30		
Naphthalene	ug/L	ND	20	20	23.0	21.7	115	109	67-125	6	30		
o-Xylene	ug/L	ND	20	20	22.2	19.4	111	97	60-143	14	30		
p-Isopropyltoluene	ug/L	ND	20	20	23.4	19.1	117	95	64-146	20	30		
sec-Butylbenzene	ug/L	ND	20	20	24.1	20.3	121	101	67-144	17	30		
Styrene	ug/L	ND	20	20	19.7	18.0	98	90	67-136	9	30		
tert-Amylmethyl ether	ug/L	ND	20	20	21.3	18.1	106	90	60-134	16	30		
tert-Butyl Alcohol	ug/L	ND	200	200	208	170	104	85	56-146	20	30		
tert-Butylbenzene	ug/L	ND	20	20	24.0	19.8	120	99	68-135	19	30		
Tetrachloroethene	ug/L	ND	20	20	21.6	18.9	108	95	67-148	13	30		
Tetrahydrofuran	ug/L	ND	200	200	365	331	182	166	51-141	10	30	M1	
Toluene	ug/L	ND	20	20	20.4	17.8	102	89	61-140	14	30		
trans-1,2-Dichloroethene	ug/L	ND	20	20	22.5	18.9	112	95	62-138	17	30		
trans-1,3-Dichloropropene	ug/L	ND	20	20	19.9	17.9	99	90	67-134	10	30		
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	51.4	45.0	103	90	30-150	13	30		
Trichloroethene	ug/L	ND	20	20	20.9	18.3	105	91	64-149	13	30		
Trichlorofluoromethane	ug/L	ND	20	20	25.0	24.3	125	121	75-150	3	30		
Vinyl acetate	ug/L	ND	20	20	19.6	16.8	98	84	49-143	15	30		
Vinyl chloride	ug/L	ND	20	20	25.9	25.2	129	126	75-133	3	30		
Xylene (Total)	ug/L	ND	60	60	64.0	56.3	107	94	63-142	13	30		
1,2-Dichloroethane-d4 (S)	%						100	102	75-137				
4-Bromofluorobenzene (S)	%						105	100	75-125				
Toluene-d8 (S)	%						101	101	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10406438

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10406354004	Trip Blank	EPA 8260B	502264		
10406438001	MW6D-GW-100517	EPA 8260B	502264		
10406438002	MW4D-GW-100517	EPA 8260B	502264		
10406438003	MW9D-GW-100517	EPA 8260B	502264		
10406438004	MW19D-GW-100517	EPA 8260B	502894		
10406438005	MW20D-GW-100517	EPA 8260B	502894		
10406438006	FD-GW-100517	EPA 8260B	502894		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10406438

Page: 1 of 1

<b>Section A</b>		<b>Section B</b>		<b>Section C</b>	
<b>Required Client Information:</b>		<b>Required Project Information:</b>		<b>Invoice Information:</b>	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone:   Fax:		Purchase Order #: PEDD# 1497		Pace Quote: Contract# 758938	
Requested Due Date: 10 Day Standard		Project Name: Freeman WA-Grain Handling Facility		Pace Project Manager: Jennifer Gross	
		Project #: 1497		Pace Profile #: 36447 / 4	
Regulatory Agency: _____					
State/Location: _____					
WA / Freeman					

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9, /, .)	MATRIX CODE (see valid codes to left)	CODE Drinking Water: DW Water: WT Waste Water: WW Product: P S&S/Solid: SL Oil: OL Wipe: WP Air: AR Other: OT Tissue: TS	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						ANALYSIS TEST	Requested Analysis Filtered (Y/N)	MS/MSD Requested				
				DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other				Y	Y	Y	Y
1	MW6D-GW-100517	WTG		10/5/17	9:35			3														001
2	MW4D-GW-100517				11:25																	002
3	MW9D-GW-100517				12:40																	003
4	MW19D-GW-100517				13:55																	004
5	MW20D-GW-100517				15:10																	005
6	FD-GW-100517				17:00																	006
7	Trip Blank				-			2														

ADDITIONAL COMMENTS	REQUISITED BY (AFFILIATION)	DATE	TIME	ACCEPTED BY (AFFILIATION)	DATE	TIME	SAMPLE CONDITIONS		
Short hold analyses are in bold	CUZM	10/6/17	1600	FEDEX	10/6/17	1600			
*Field filtered by client				<i>[Signature]</i>	10/9/17	930	4.0	Y	Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<i>Steve Demus</i>				
SIGNATURE of SAMPLER:	<i>[Signature]</i>	DATE Signed:	10/5/17		

**Sample Condition Upon Receipt - ESI Tech Specs**     
 Client Name: CH2M HILL     
 Project #: WO# : 10406438

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     SpeedDee     Other: \_\_\_\_\_  
 Tracking Number: 7448 1032 7955



Custody Seal on Cooler/Box Present?  Yes     No     
 Seals Intact?  Yes     No     
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_     
 Temp Blank?  Yes     No  
 Thermometer Used:  151401163     G87A9155100842     
 Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun

Cooler Temp Read (°C): 4.2     
 Cooler Temp Corrected (°C): 4.0     
 Biological Tissue Frozen?  Yes     No     N/A  
 Temp should be above freezing to 6°C     
 Correction Factor: -0.2     
 Date and Initials of Person Examining Contents: ME 10/9/17

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exception: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>see exceptions</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: Steve Demus

Date/Time: 10/09/17 via email

Field Data Required?  Yes     No

Comments/Resolution: Okay to proceed with analysis with headspace for 8260

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1315</u>	Temp: <u>4.2</u>	Corrected Temp: <u>4.0</u>
Time: <u>1324</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

JENNIFER GROSS

Date: \_\_\_\_\_

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



**SCUR Exceptions:** Head space

**Workorder #:** 10406438

Issue	Sample ID	Container Type/#
Head space > 6mm	MW6D-GW-100517	1/3 V69H
"	MW4D-GW-100517	3/3 V69H
"	MW9D-GW-100517	3/3 V69H
"	MW19D-GW-100517	3/3 V69H
"	MW20D-GW-100517	3/3 V69H
"	FD-GW-100517	3/3 V69H

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

October 24, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

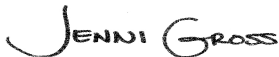
RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 12, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
 A2LA Certification #: 2926.01  
 Alabama Certification #: 40770  
 Alaska Contaminated Sites Certification #: 17-009  
 Alaska DW Certification #: MN00064  
 Arizona Certification #: AZ0014  
 Arkansas Certification #: 88-0680  
 California Certification #: 2929  
 CNMI Saipan Certification #: MP0003  
 Colorado Certification #: MN00064  
 Connecticut Certification #: PH-0256  
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
 Florida Certification #: E87605  
 Georgia Certification #: 959  
 Guam EPA Certification #: MN00064  
 Hawaii Certification #: MN00064  
 Idaho Certification #: MN00064  
 Illinois Certification #: 200011  
 Indiana Certification #: C-MN-01  
 Iowa Certification #: 368  
 Kansas Certification #: E-10167  
 Kentucky DW Certification #: 90062  
 Kentucky WW Certification #: 90062  
 Louisiana DEQ Certification #: 03086  
 Louisiana DW Certification #: MN00064  
 Maine Certification #: MN00064  
 Maryland Certification #: 322  
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
 Minnesota Certification #: 027-053-137  
 Mississippi Certification #: MN00064  
 Montana Certification #: CERT0092  
 Nebraska Certification #: NE-OS-18-06  
 Nevada Certification #: MN00064  
 New Hampshire Certification #: 2081  
 New Jersey Certification #: MN002  
 New York Certification #: 11647  
 North Carolina DW Certification #: 27700  
 North Carolina WW Certification #: 530  
 North Dakota Certification #: R-036  
 Ohio DW Certification #: 41244  
 Ohio VAP Certification #: CL101  
 Oklahoma Certification #: 9507  
 Oregon NwTPH Certification #: MN300001  
 Oregon Secondary Certification #: MN200001  
 Pennsylvania Certification #: 68-00563  
 Puerto Rico Certification #: MN00064  
 South Carolina Certification #: 74003001  
 Tennessee Certification #: TN02818  
 Texas Certification #: T104704192  
 Utah Certification #: MN00064  
 Virginia Certification #: 460163  
 Washington Certification #: C486  
 West Virginia DW Certification #: 9952 C  
 West Virginia DEP Certification #: 382  
 Wisconsin Certification #: 999407970  
 Wyoming via EPA Region 8 Certification #: 8TMS-L

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
 Montana Certificate #CERT0103  
 California Certification #2973  
 California Certification #2973  
 Alaska Certification UST-107  
 Alaska Certification UST-107  
 Alaska Certification #MN01084  
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
 North Dakota Certification: # R-203  
 Wisconsin DNR Certification #: 998027470  
 WA Department of Ecology Lab ID# C1007  
 Nevada DNR #MN010842018-1  
 Oklahoma Department of Environmental Quality  
 California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
 Florida Department of Health (NELAC): E87595  
 Illinois Environmental Protection Agency: 0025721  
 Kansas Department of Health and Environment (NELAC): E-10266  
 Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
 Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
 U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
 Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10406825001	MW5D-GW-101017	Water	10/10/17 09:25	10/12/17 09:35
10406825002	MW1D-GW-101017	Water	10/10/17 12:30	10/12/17 09:35
10406825003	MW17D-GW-101017	Water	10/10/17 15:40	10/12/17 09:35
10406825004	MW7S-GW-101017	Water	10/10/17 14:05	10/12/17 09:35
10406825005	WS5-GW-101117	Water	10/11/17 08:10	10/12/17 09:35

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10406825001	MW5D-GW-101017	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10406825002	MW1D-GW-101017	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10406825003	MW17D-GW-101017	RSK 175	MJL	3	PASI-M
		6010C Met	DM, IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10406825004	MW7S-GW-101017	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10406825005	WS5-GW-101117	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10406825001</b>	<b>MW5D-GW-101017</b>					
RSK 175	Methane	2.6J	ug/L	10.0	10/17/17 06:51	
6010C Met	Barium, Dissolved	92.6	ug/L	10.0	10/17/17 12:06	
6010C Met	Calcium, Dissolved	50400	ug/L	500	10/17/17 12:06	
6010C Met	Copper, Dissolved	1.6J	ug/L	10.0	10/17/17 12:06	
6010C Met	Magnesium, Dissolved	15400	ug/L	500	10/17/17 12:06	
6010C Met	Manganese, Dissolved	12.0	ug/L	5.0	10/17/17 12:06	
6010C Met	Potassium, Dissolved	2990	ug/L	2500	10/17/17 12:06	
6010C Met	Sodium, Dissolved	23100	ug/L	1000	10/17/17 12:06	
6010C Met	Vanadium, Dissolved	4.6J	ug/L	15.0	10/17/17 12:06	
6010C Met	Zinc, Dissolved	3.7J	ug/L	20.0	10/17/17 12:06	
EPA 353.2	Nitrogen, NO2 plus NO3	0.41	mg/L	0.020	10/14/17 10:29	
SM 5310C	Total Organic Carbon	0.60J	mg/L	1.0	10/18/17 18:13	
<b>10406825002</b>	<b>MW1D-GW-101017</b>					
RSK 175	Methane	5.2J	ug/L	10.0	10/17/17 06:58	
6010C Met	Aluminum, Dissolved	37.3J	ug/L	200	10/17/17 12:10	B
6010C Met	Barium, Dissolved	69.1	ug/L	10.0	10/17/17 12:10	
6010C Met	Calcium, Dissolved	53600	ug/L	500	10/17/17 12:10	
6010C Met	Chromium, Dissolved	0.56J	ug/L	10.0	10/17/17 12:10	
6010C Met	Copper, Dissolved	1.6J	ug/L	10.0	10/17/17 12:10	
6010C Met	Iron, Dissolved	22.7J	ug/L	50.0	10/17/17 12:10	
6010C Met	Magnesium, Dissolved	13400	ug/L	500	10/17/17 12:10	
6010C Met	Manganese, Dissolved	96.7	ug/L	5.0	10/17/17 12:10	
6010C Met	Nickel, Dissolved	2.1J	ug/L	20.0	10/17/17 12:10	
6010C Met	Potassium, Dissolved	1900J	ug/L	2500	10/17/17 12:10	
6010C Met	Sodium, Dissolved	12400	ug/L	1000	10/17/17 12:10	
6010C Met	Vanadium, Dissolved	1.4J	ug/L	15.0	10/17/17 12:10	
6010C Met	Zinc, Dissolved	4.5J	ug/L	20.0	10/17/17 12:10	
SM 2320B	Alkalinity, Total as CaCO3	204	mg/L	5.0	10/21/17 11:47	
SM 2540C	Total Dissolved Solids	247	mg/L	10.0	10/16/17 16:53	
EPA 300.0	Chloride	1.7	mg/L	1.2	10/12/17 11:53	B
EPA 300.0	Nitrate as N	0.097J	mg/L	0.10	10/12/17 11:53	B
EPA 300.0	Sulfate	3.6	mg/L	1.2	10/12/17 11:53	B
EPA 353.2	Nitrogen, NO2 plus NO3	0.090	mg/L	0.020	10/14/17 10:30	FS
EPA 410.4	Chemical Oxygen Demand	107	mg/L	50.0	10/16/17 15:18	
SM 5310C	Total Organic Carbon	0.75J	mg/L	1.0	10/18/17 18:26	
<b>10406825003</b>	<b>MW17D-GW-101017</b>					
RSK 175	Ethene	2.9J	ug/L	10.0	10/17/17 07:05	
RSK 175	Methane	2.1J	ug/L	10.0	10/17/17 07:05	
6010C Met	Aluminum, Dissolved	23.9J	ug/L	200	10/17/17 12:14	B
6010C Met	Barium, Dissolved	57.2	ug/L	10.0	10/17/17 12:14	
6010C Met	Calcium, Dissolved	42900	ug/L	500	10/17/17 12:14	
6010C Met	Chromium, Dissolved	1.2J	ug/L	10.0	10/17/17 12:14	
6010C Met	Iron, Dissolved	158	ug/L	50.0	10/17/17 12:14	
6010C Met	Magnesium, Dissolved	18300	ug/L	500	10/17/17 12:14	
6010C Met	Manganese, Dissolved	275	ug/L	5.0	10/17/17 12:14	
6010C Met	Nickel, Dissolved	3.4J	ug/L	20.0	10/17/17 12:14	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10406825003</b>	<b>MW17D-GW-101017</b>					
6010C Met	Potassium, Dissolved	17700	ug/L	2500	10/17/17 12:14	
6010C Met	Sodium, Dissolved	56300	ug/L	1000	10/19/17 14:22	
6010C Met	Vanadium, Dissolved	1.0J	ug/L	15.0	10/17/17 12:14	
SM 2320B	Alkalinity, Total as CaCO3	213	mg/L	5.0	10/21/17 11:52	
SM 2540C	Total Dissolved Solids	458	mg/L	10.0	10/16/17 16:53	
SM 4500-S-2 D	Sulfide, Total	0.039	mg/L	0.020	10/14/17 10:04	
EPA 300.0	Chloride	35.7	mg/L	1.2	10/12/17 14:12	
EPA 300.0	Sulfate	79.7	mg/L	1.2	10/12/17 14:12	
EPA 353.2	Nitrogen, NO2 plus NO3	0.015J	mg/L	0.020	10/14/17 10:31	
EPA 410.4	Chemical Oxygen Demand	56.5	mg/L	50.0	10/16/17 15:18	
SM 5310C	Total Organic Carbon	11.7	mg/L	1.0	10/18/17 18:40	
<b>10406825004</b>	<b>MW7S-GW-101017</b>					
RSK 175	Methane	1.8J	ug/L	10.0	10/17/17 07:12	
6010C Met	Aluminum, Dissolved	73.2J	ug/L	200	10/17/17 12:18	B
6010C Met	Barium, Dissolved	23.7	ug/L	10.0	10/17/17 12:18	
6010C Met	Cadmium, Dissolved	0.93J	ug/L	3.0	10/17/17 12:18	
6010C Met	Calcium, Dissolved	41800	ug/L	500	10/17/17 12:18	
6010C Met	Iron, Dissolved	121	ug/L	50.0	10/17/17 12:18	
6010C Met	Magnesium, Dissolved	11200	ug/L	500	10/17/17 12:18	
6010C Met	Manganese, Dissolved	6.6	ug/L	5.0	10/17/17 12:18	
6010C Met	Potassium, Dissolved	1070J	ug/L	2500	10/17/17 12:18	
6010C Met	Sodium, Dissolved	13300	ug/L	1000	10/17/17 12:18	
6010C Met	Vanadium, Dissolved	1.7J	ug/L	15.0	10/17/17 12:18	
6010C Met	Zinc, Dissolved	13.6J	ug/L	20.0	10/17/17 12:18	
SM 2320B	Alkalinity, Total as CaCO3	104	mg/L	5.0	10/21/17 11:56	
SM 2540C	Total Dissolved Solids	236	mg/L	10.0	10/17/17 15:06	
EPA 300.0	Chloride	10.3	mg/L	1.2	10/12/17 12:24	M1
EPA 300.0	Nitrate as N	7.5	mg/L	0.10	10/12/17 12:24	M1
EPA 300.0	Sulfate	22.1	mg/L	1.2	10/12/17 12:24	M1
EPA 353.2	Nitrogen, NO2 plus NO3	7.8	mg/L	0.20	10/14/17 11:26	M6
EPA 410.4	Chemical Oxygen Demand	99.5	mg/L	50.0	10/16/17 15:18	
SM 5310C	Total Organic Carbon	19.7	mg/L	1.0	10/18/17 18:54	
<b>10406825005</b>	<b>WS5-GW-101117</b>					
RSK 175	Methane	2.3J	ug/L	10.0	10/17/17 12:43	
6010C Met	Aluminum, Dissolved	15.5J	ug/L	200	10/17/17 12:38	B
6010C Met	Barium, Dissolved	51.6	ug/L	10.0	10/17/17 12:38	
6010C Met	Calcium, Dissolved	35800	ug/L	500	10/17/17 12:38	
6010C Met	Copper, Dissolved	6.1J	ug/L	10.0	10/17/17 12:38	
6010C Met	Magnesium, Dissolved	15800	ug/L	500	10/17/17 12:38	
6010C Met	Potassium, Dissolved	5210	ug/L	2500	10/17/17 12:38	
6010C Met	Sodium, Dissolved	16100	ug/L	1000	10/17/17 12:38	
6010C Met	Vanadium, Dissolved	18.5	ug/L	15.0	10/17/17 12:38	
6010C Met	Zinc, Dissolved	29.8	ug/L	20.0	10/17/17 12:38	
SM 2320B	Alkalinity, Total as CaCO3	172	mg/L	5.0	10/21/17 15:01	
SM 2540C	Total Dissolved Solids	218	mg/L	10.0	10/18/17 16:34	
EPA 300.0	Chloride	3.0	mg/L	1.2	10/12/17 15:06	B

### REPORT OF LABORATORY ANALYSIS

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## SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10406825005</b>	<b>WS5-GW-101117</b>					
EPA 300.0	Nitrate as N	1.0	mg/L	0.10	10/12/17 15:06	
EPA 300.0	Sulfate	5.5	mg/L	1.2	10/12/17 15:06	
EPA 353.2	Nitrogen, NO2 plus NO3	1.0	mg/L	0.020	10/14/17 10:45	
SM 5310C	Total Organic Carbon	0.26J	mg/L	1.0	10/20/17 17:57	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

5 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 502717

R1: RPD value was outside control limits.

- DUP (Lab ID: 2732629)
- Methane

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

5 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 502327

B: Analyte was detected in the associated method blank.

- BLANK for HBN 502327 [MPRP/761 (Lab ID: 2730420)]
- Aluminum, Dissolved

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

5 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 503872

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10407319002,10407707002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2739592)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

5 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

### General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 502163

B: Analyte was detected in the associated method blank.

- BLANK for HBN 502163 [WETA/330 (Lab ID: 2729315)]
  - Chloride
  - Nitrate as N
  - Sulfate

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502163

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406825004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2729317)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2729318)
  - Chloride
  - Nitrate as N
  - Sulfate

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

### General Information:

5 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502447

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406714001,10406825004

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 2730804)
- Nitrogen, NO2 plus NO3

QC Batch: 502559

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406905001,10406907004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2731781)
- Nitrogen, NO2 plus NO3

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 2731778)
- Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2731779)
- Nitrogen, NO2 plus NO3

### Additional Comments:

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

5 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

5 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Sample: **MW5D-GW-101017** Lab ID: **10406825001** Collected: 10/10/17 09:25 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/17/17 06:51	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/17/17 06:51	74-85-1	
Methane	2.6J	ug/L	10.0	1.1	1		10/17/17 06:51	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/13/17 12:32	10/17/17 12:06	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/13/17 12:32	10/17/17 12:06	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/13/17 12:32	10/17/17 12:06	7440-38-2	
Barium, Dissolved	92.6	ug/L	10.0	0.22	1	10/13/17 12:32	10/17/17 12:06	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/13/17 12:32	10/17/17 12:06	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/13/17 12:32	10/17/17 12:06	7440-43-9	
Calcium, Dissolved	50400	ug/L	500	24.7	1	10/13/17 12:32	10/17/17 12:06	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/13/17 12:32	10/17/17 12:06	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/13/17 12:32	10/17/17 12:06	7440-48-4	
Copper, Dissolved	1.6J	ug/L	10.0	0.83	1	10/13/17 12:32	10/17/17 12:06	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/13/17 12:32	10/17/17 12:06	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/13/17 12:32	10/17/17 12:06	7439-92-1	
Magnesium, Dissolved	15400	ug/L	500	2.6	1	10/13/17 12:32	10/17/17 12:06	7439-95-4	
Manganese, Dissolved	12.0	ug/L	5.0	0.38	1	10/13/17 12:32	10/17/17 12:06	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/13/17 12:32	10/17/17 12:06	7440-02-0	
Potassium, Dissolved	2990	ug/L	2500	126	1	10/13/17 12:32	10/17/17 12:06	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/13/17 12:32	10/17/17 12:06	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/13/17 12:32	10/17/17 12:06	7440-22-4	
Sodium, Dissolved	23100	ug/L	1000	44.6	1	10/13/17 12:32	10/17/17 12:06	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/13/17 12:32	10/17/17 12:06	7440-28-0	
Vanadium, Dissolved	4.6J	ug/L	15.0	0.42	1	10/13/17 12:32	10/17/17 12:06	7440-62-2	
Zinc, Dissolved	3.7J	ug/L	20.0	1.8	1	10/13/17 12:32	10/17/17 12:06	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/13/17 09:51	10/18/17 17:09	7439-97-6	
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/14/17 10:02	18496-25-8	
<b>353.2 Nitrate + Nitrite</b> Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	0.41	mg/L	0.020	0.0075	1		10/14/17 10:29		
<b>410.4 COD</b> Analytical Method: EPA 410.4 Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:18		
<b>5310C TOC</b> Analytical Method: SM 5310C									
Total Organic Carbon	0.60J	mg/L	1.0	0.20	1		10/18/17 18:13	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

**Sample:** MW1D-GW-101017      **Lab ID:** 10406825002      Collected: 10/10/17 12:30      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/17/17 06:58	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/17/17 06:58	74-85-1	
Methane	5.2J	ug/L	10.0	1.1	1		10/17/17 06:58	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	37.3J	ug/L	200	8.6	1	10/13/17 12:32	10/17/17 12:10	7429-90-5	B
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/13/17 12:32	10/17/17 12:10	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/13/17 12:32	10/17/17 12:10	7440-38-2	
Barium, Dissolved	69.1	ug/L	10.0	0.22	1	10/13/17 12:32	10/17/17 12:10	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/13/17 12:32	10/17/17 12:10	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/13/17 12:32	10/17/17 12:10	7440-43-9	
Calcium, Dissolved	53600	ug/L	500	24.7	1	10/13/17 12:32	10/17/17 12:10	7440-70-2	
Chromium, Dissolved	0.56J	ug/L	10.0	0.50	1	10/13/17 12:32	10/17/17 12:10	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/13/17 12:32	10/17/17 12:10	7440-48-4	
Copper, Dissolved	1.6J	ug/L	10.0	0.83	1	10/13/17 12:32	10/17/17 12:10	7440-50-8	
Iron, Dissolved	22.7J	ug/L	50.0	16.7	1	10/13/17 12:32	10/17/17 12:10	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/13/17 12:32	10/17/17 12:10	7439-92-1	
Magnesium, Dissolved	13400	ug/L	500	2.6	1	10/13/17 12:32	10/17/17 12:10	7439-95-4	
Manganese, Dissolved	96.7	ug/L	5.0	0.38	1	10/13/17 12:32	10/17/17 12:10	7439-96-5	
Nickel, Dissolved	2.1J	ug/L	20.0	1.1	1	10/13/17 12:32	10/17/17 12:10	7440-02-0	
Potassium, Dissolved	1900J	ug/L	2500	126	1	10/13/17 12:32	10/17/17 12:10	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/13/17 12:32	10/17/17 12:10	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/13/17 12:32	10/17/17 12:10	7440-22-4	
Sodium, Dissolved	12400	ug/L	1000	44.6	1	10/13/17 12:32	10/17/17 12:10	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/13/17 12:32	10/17/17 12:10	7440-28-0	
Vanadium, Dissolved	1.4J	ug/L	15.0	0.42	1	10/13/17 12:32	10/17/17 12:10	7440-62-2	
Zinc, Dissolved	4.5J	ug/L	20.0	1.8	1	10/13/17 12:32	10/17/17 12:10	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/13/17 09:51	10/18/17 17:11	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	204	mg/L	5.0	1.4	1		10/21/17 11:47		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	247	mg/L	10.0	5.0	1		10/16/17 16:53		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.025	mg/L	0.10	0.025	5		10/14/17 10:16	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.7	mg/L	1.2	0.14	1		10/12/17 11:53	16887-00-6	B
Nitrate as N	0.097J	mg/L	0.10	0.0079	1		10/12/17 11:53	14797-55-8	B
Sulfate	3.6	mg/L	1.2	0.27	1		10/12/17 11:53	14808-79-8	B

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Sample: MW1D-GW-101017**      **Lab ID: 10406825002**      Collected: 10/10/17 12:30      Received: 10/12/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.090</b>	mg/L	0.020	0.0075	1		10/14/17 10:30		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>107</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:18		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.75J</b>	mg/L	1.0	0.20	1		10/18/17 18:26	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Sample: **MW17D-GW-101017** Lab ID: **10406825003** Collected: 10/10/17 15:40 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/17/17 07:05	74-84-0	
Ethene	2.9J	ug/L	10.0	0.68	1		10/17/17 07:05	74-85-1	
Methane	2.1J	ug/L	10.0	1.1	1		10/17/17 07:05	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	23.9J	ug/L	200	8.6	1	10/13/17 12:32	10/17/17 12:14	7429-90-5	B
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/13/17 12:32	10/17/17 12:14	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/13/17 12:32	10/17/17 12:14	7440-38-2	
Barium, Dissolved	57.2	ug/L	10.0	0.22	1	10/13/17 12:32	10/17/17 12:14	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/13/17 12:32	10/17/17 12:14	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/13/17 12:32	10/17/17 12:14	7440-43-9	
Calcium, Dissolved	42900	ug/L	500	24.7	1	10/13/17 12:32	10/17/17 12:14	7440-70-2	
Chromium, Dissolved	1.2J	ug/L	10.0	0.50	1	10/13/17 12:32	10/17/17 12:14	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/13/17 12:32	10/17/17 12:14	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/13/17 12:32	10/17/17 12:14	7440-50-8	
Iron, Dissolved	158	ug/L	50.0	16.7	1	10/13/17 12:32	10/17/17 12:14	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/13/17 12:32	10/17/17 12:14	7439-92-1	
Magnesium, Dissolved	18300	ug/L	500	2.6	1	10/13/17 12:32	10/17/17 12:14	7439-95-4	
Manganese, Dissolved	275	ug/L	5.0	0.38	1	10/13/17 12:32	10/17/17 12:14	7439-96-5	
Nickel, Dissolved	3.4J	ug/L	20.0	1.1	1	10/13/17 12:32	10/17/17 12:14	7440-02-0	
Potassium, Dissolved	17700	ug/L	2500	126	1	10/13/17 12:32	10/17/17 12:14	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/13/17 12:32	10/17/17 12:14	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/13/17 12:32	10/17/17 12:14	7440-22-4	
Sodium, Dissolved	56300	ug/L	1000	44.6	1	10/13/17 12:32	10/19/17 14:22	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/13/17 12:32	10/17/17 12:14	7440-28-0	
Vanadium, Dissolved	1.0J	ug/L	15.0	0.42	1	10/13/17 12:32	10/17/17 12:14	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	10/13/17 12:32	10/17/17 12:14	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/13/17 09:51	10/18/17 17:18	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	213	mg/L	5.0	1.4	1		10/21/17 11:52		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	458	mg/L	10.0	5.0	1		10/16/17 16:53		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.039	mg/L	0.020	0.0050	1		10/14/17 10:04	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	35.7	mg/L	1.2	0.14	1		10/12/17 14:12	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		10/12/17 14:12	14797-55-8	
Sulfate	79.7	mg/L	1.2	0.27	1		10/12/17 14:12	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Sample: MW17D-GW-101017**      **Lab ID: 10406825003**      Collected: 10/10/17 15:40      Received: 10/12/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.015J</b>	mg/L	0.020	0.0075	1		10/14/17 10:31		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>56.5</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:18		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>11.7</b>	mg/L	1.0	0.20	1		10/18/17 18:40	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Sample: **MW7S-GW-101017** Lab ID: **10406825004** Collected: 10/10/17 14:05 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/17/17 07:12	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/17/17 07:12	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		10/17/17 07:12	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	73.2J	ug/L	200	8.6	1	10/13/17 12:32	10/17/17 12:18	7429-90-5	B
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/13/17 12:32	10/17/17 12:18	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/13/17 12:32	10/17/17 12:18	7440-38-2	
Barium, Dissolved	23.7	ug/L	10.0	0.22	1	10/13/17 12:32	10/17/17 12:18	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/13/17 12:32	10/17/17 12:18	7440-41-7	
Cadmium, Dissolved	0.93J	ug/L	3.0	0.46	1	10/13/17 12:32	10/17/17 12:18	7440-43-9	
Calcium, Dissolved	41800	ug/L	500	24.7	1	10/13/17 12:32	10/17/17 12:18	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/13/17 12:32	10/17/17 12:18	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/13/17 12:32	10/17/17 12:18	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/13/17 12:32	10/17/17 12:18	7440-50-8	
Iron, Dissolved	121	ug/L	50.0	16.7	1	10/13/17 12:32	10/17/17 12:18	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/13/17 12:32	10/17/17 12:18	7439-92-1	
Magnesium, Dissolved	11200	ug/L	500	2.6	1	10/13/17 12:32	10/17/17 12:18	7439-95-4	
Manganese, Dissolved	6.6	ug/L	5.0	0.38	1	10/13/17 12:32	10/17/17 12:18	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/13/17 12:32	10/17/17 12:18	7440-02-0	
Potassium, Dissolved	1070J	ug/L	2500	126	1	10/13/17 12:32	10/17/17 12:18	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/13/17 12:32	10/17/17 12:18	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/13/17 12:32	10/17/17 12:18	7440-22-4	
Sodium, Dissolved	13300	ug/L	1000	44.6	1	10/13/17 12:32	10/17/17 12:18	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/13/17 12:32	10/17/17 12:18	7440-28-0	
Vanadium, Dissolved	1.7J	ug/L	15.0	0.42	1	10/13/17 12:32	10/17/17 12:18	7440-62-2	
Zinc, Dissolved	13.6J	ug/L	20.0	1.8	1	10/13/17 12:32	10/17/17 12:18	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/13/17 09:51	10/18/17 17:20	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	104	mg/L	5.0	1.4	1		10/21/17 11:56		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	236	mg/L	10.0	5.0	1		10/17/17 15:06		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/14/17 10:07	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	10.3	mg/L	1.2	0.14	1		10/12/17 12:24	16887-00-6	M1
Nitrate as N	7.5	mg/L	0.10	0.0079	1		10/12/17 12:24	14797-55-8	M1
Sulfate	22.1	mg/L	1.2	0.27	1		10/12/17 12:24	14808-79-8	M1

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Sample: MW7S-GW-101017**      **Lab ID: 10406825004**      Collected: 10/10/17 14:05      Received: 10/12/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>7.8</b>	mg/L	0.20	0.075	10		10/14/17 11:26		M6
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>99.5</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:18		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>19.7</b>	mg/L	1.0	0.20	1		10/18/17 18:54	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

**Sample:** WS5-GW-101117      **Lab ID:** 10406825005      Collected: 10/11/17 08:10      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/17/17 12:43	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/17/17 12:43	74-85-1	
Methane	2.3J	ug/L	10.0	1.1	1		10/17/17 12:43	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	15.5J	ug/L	200	8.6	1	10/13/17 12:32	10/17/17 12:38	7429-90-5	B
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/13/17 12:32	10/17/17 12:38	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/13/17 12:32	10/17/17 12:38	7440-38-2	
Barium, Dissolved	51.6	ug/L	10.0	0.22	1	10/13/17 12:32	10/17/17 12:38	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/13/17 12:32	10/17/17 12:38	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/13/17 12:32	10/17/17 12:38	7440-43-9	
Calcium, Dissolved	35800	ug/L	500	24.7	1	10/13/17 12:32	10/17/17 12:38	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/13/17 12:32	10/17/17 12:38	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/13/17 12:32	10/17/17 12:38	7440-48-4	
Copper, Dissolved	6.1J	ug/L	10.0	0.83	1	10/13/17 12:32	10/17/17 12:38	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/13/17 12:32	10/17/17 12:38	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/13/17 12:32	10/17/17 12:38	7439-92-1	
Magnesium, Dissolved	15800	ug/L	500	2.6	1	10/13/17 12:32	10/17/17 12:38	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	10/13/17 12:32	10/17/17 12:38	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/13/17 12:32	10/17/17 12:38	7440-02-0	
Potassium, Dissolved	5210	ug/L	2500	126	1	10/13/17 12:32	10/17/17 12:38	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/13/17 12:32	10/17/17 12:38	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/13/17 12:32	10/17/17 12:38	7440-22-4	
Sodium, Dissolved	16100	ug/L	1000	44.6	1	10/13/17 12:32	10/17/17 12:38	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/13/17 12:32	10/17/17 12:38	7440-28-0	
Vanadium, Dissolved	18.5	ug/L	15.0	0.42	1	10/13/17 12:32	10/17/17 12:38	7440-62-2	
Zinc, Dissolved	29.8	ug/L	20.0	1.8	1	10/13/17 12:32	10/17/17 12:38	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/13/17 09:51	10/18/17 17:27	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	172	mg/L	5.0	1.4	1		10/21/17 15:01		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	218	mg/L	10.0	5.0	1		10/18/17 16:34		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/14/17 10:10	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.0	mg/L	1.2	0.14	1		10/12/17 15:06	16887-00-6	B
Nitrate as N	1.0	mg/L	0.10	0.0079	1		10/12/17 15:06	14797-55-8	
Sulfate	5.5	mg/L	1.2	0.27	1		10/12/17 15:06	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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**Sample: WS5-GW-101117**      **Lab ID: 10406825005**      Collected: 10/11/17 08:10      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.0</b>	mg/L	0.020	0.0075	1		10/14/17 10:45		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:19		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.26J</b>	mg/L	1.0	0.20	1		10/20/17 17:57	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 502714 Analysis Method: RSK 175  
 QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
 Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004

METHOD BLANK: 2732600 Matrix: Water  
 Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/17/17 06:30	
Ethene	ug/L	<0.68	10.0	0.68	10/17/17 06:30	
Methane	ug/L	1.5J	10.0	1.1	10/17/17 06:30	

LABORATORY CONTROL SAMPLE & LCSD: 2732601

Parameter	Units	2732601		2732602		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec						
Ethane	ug/L	114	103	106	90	93	85-115	3	20		
Ethene	ug/L	106	96.6	99.2	91	94	85-115	3	20		
Methane	ug/L	60.7	54.4	56.1	90	92	85-115	3	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732603

Parameter	Units	2732603		2732604		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10406825004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Ethane	ug/L	<4.9	114	114	85.1	117	75	103	30-150	31	20 R1
Ethene	ug/L	<0.68	106	106	80.8	110	76	103	30-150	30	20 R1
Methane	ug/L	1.8J	60.7	60.7	45.9	61.7	73	99	30-150	29	20 R1

SAMPLE DUPLICATE: 2732605

Parameter	Units	60255199003 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	1970	1790	9	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 502717 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10406825005

METHOD BLANK: 2732624 Matrix: Water  
Associated Lab Samples: 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/17/17 10:08	
Ethene	ug/L	<0.68	10.0	0.68	10/17/17 10:08	
Methane	ug/L	1.6J	10.0	1.1	10/17/17 10:08	

LABORATORY CONTROL SAMPLE & LCSD: 2732625

Parameter	Units	2732626								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	106	108	93	95	85-115	2	20	
Ethene	ug/L	106	99.2	102	94	96	85-115	3	20	
Methane	ug/L	60.7	56.1	57.2	92	94	85-115	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732627

Parameter	Units	2732628										Qual
		60255199006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	ND	114	114	85.0	56.8	74	49	30-150	40	20	R1
Ethene	ug/L	ND	106	106	80.0	53.6	75	51	30-150	39	20	R1
Methane	ug/L	5580	60.7	60.7	4360	2900	-2010	-4410	30-150	40	20	M1,R1

SAMPLE DUPLICATE: 2732629

Parameter	Units	60255199008 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	65.4	20.5	104	20 R1	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 502342

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

METHOD BLANK: 2730480

Matrix: Water

Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	10/18/17 16:55	

LABORATORY CONTROL SAMPLE: 2730481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730482 2730483

Parameter	Units	2730482		2730483		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10406825004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury, Dissolved	ug/L	<0.062	5	5	5.2	5.2	105	104	80-120	0	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 502327

Analysis Method: 6010C Met

QC Batch Method: EPA 3010

Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

METHOD BLANK: 2730420

Matrix: Water

Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	12.9J	200	8.6	10/17/17 11:23	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	10/17/17 11:23	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	10/17/17 11:23	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	10/17/17 11:23	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	10/17/17 11:23	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	10/17/17 11:23	
Calcium, Dissolved	ug/L	<24.7	500	24.7	10/17/17 11:23	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	10/17/17 11:23	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	10/17/17 11:23	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	10/17/17 11:23	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	10/17/17 11:23	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	10/17/17 11:23	
Magnesium, Dissolved	ug/L	8.3J	500	2.6	10/17/17 11:23	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	10/17/17 11:23	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	10/17/17 11:23	
Potassium, Dissolved	ug/L	<126	2500	126	10/17/17 11:23	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	10/17/17 11:23	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	10/17/17 11:23	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	10/17/17 11:23	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	10/17/17 11:23	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	10/17/17 11:23	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	10/17/17 11:23	

LABORATORY CONTROL SAMPLE: 2730421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20600	103	80-120	
Antimony, Dissolved	ug/L	1000	1020	102	80-120	
Arsenic, Dissolved	ug/L	1000	1000	100	80-120	
Barium, Dissolved	ug/L	1000	1020	102	80-120	
Beryllium, Dissolved	ug/L	1000	976	98	80-120	
Cadmium, Dissolved	ug/L	1000	1010	101	80-120	
Calcium, Dissolved	ug/L	20000	20200	101	80-120	
Chromium, Dissolved	ug/L	1000	1000	100	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	992	99	80-120	
Iron, Dissolved	ug/L	20000	20000	100	80-120	
Lead, Dissolved	ug/L	1000	1020	102	80-120	
Magnesium, Dissolved	ug/L	20000	20800	104	80-120	
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

LABORATORY CONTROL SAMPLE: 2730421

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1010	101	80-120	
Potassium, Dissolved	ug/L	20000	21200	106	80-120	
Selenium, Dissolved	ug/L	1000	1010	101	80-120	
Silver, Dissolved	ug/L	500	499	100	80-120	
Sodium, Dissolved	ug/L	20000	21600	108	80-120	
Thallium, Dissolved	ug/L	1000	1020	102	80-120	
Vanadium, Dissolved	ug/L	1000	1010	101	80-120	
Zinc, Dissolved	ug/L	1000	1020	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730422 2730423

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10406825004 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	73.2J	20000	20000	21100	21200	105	106	75-125	1	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	1040	1060	104	105	75-125	2	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	1030	1040	103	104	75-125	1	20	
Barium, Dissolved	ug/L	23.7	1000	1000	1070	1070	105	105	75-125	0	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	1000	1010	100	101	75-125	0	20	
Cadmium, Dissolved	ug/L	0.93J	1000	1000	1030	1040	103	104	75-125	0	20	
Calcium, Dissolved	ug/L	41800	20000	20000	61800	62300	100	102	75-125	1	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	1030	1030	103	103	75-125	0	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	1030	1030	103	103	75-125	0	20	
Copper, Dissolved	ug/L	<0.83	1000	1000	1020	1030	102	102	75-125	0	20	
Iron, Dissolved	ug/L	121	20000	20000	20700	20700	103	103	75-125	0	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	1040	1050	104	105	75-125	1	20	
Magnesium, Dissolved	ug/L	11200	20000	20000	31700	31900	102	103	75-125	1	20	
Manganese, Dissolved	ug/L	6.6	1000	1000	1040	1050	103	104	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	1020	1030	102	103	75-125	1	20	
Potassium, Dissolved	ug/L	1070J	20000	20000	23500	23700	112	113	75-125	1	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1030	1040	103	104	75-125	1	20	
Silver, Dissolved	ug/L	<0.27	500	500	513	515	102	103	75-125	0	20	
Sodium, Dissolved	ug/L	13300	20000	20000	34800	35300	107	110	75-125	1	20	
Thallium, Dissolved	ug/L	<4.8	1000	1000	1030	1040	103	104	75-125	1	20	
Vanadium, Dissolved	ug/L	1.7J	1000	1000	1030	1040	103	104	75-125	0	20	
Zinc, Dissolved	ug/L	13.6J	1000	1000	1050	1060	103	104	75-125	1	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 503865 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10406825002, 10406825003, 10406825004

METHOD BLANK: 2739447 Matrix: Water  
Associated Lab Samples: 10406825002, 10406825003, 10406825004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	10/21/17 09:13	

LABORATORY CONTROL SAMPLE & LCSD: 2739448 2739449

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.9	40.8	105	102	90-110	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2739450 2739451

Parameter	Units	10407026003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	<1.4	40	40	39.5	39.8	99	100	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2739452 2739453

Parameter	Units	10406825004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	104	40	40	140	148	88	108	80-120	5	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 503872 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10406825005

METHOD BLANK: 2739588 Matrix: Water  
Associated Lab Samples: 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	10/21/17 13:57	

LABORATORY CONTROL SAMPLE & LCSD: 2739589 2739590

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	41.1	40.9	103	102	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2739591 2739592

Parameter	Units	10407707002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	251	40	40	294	300	106	122	80-120	2	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2739593 2739594

Parameter	Units	10407319002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	152	40	40	196	193	110	102	80-120	2	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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QC Batch: 502462	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 10406825002, 10406825003	

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METHOD BLANK: 2730880 Matrix: Water

Associated Lab Samples: 10406825002, 10406825003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/16/17 16:53	

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LABORATORY CONTROL SAMPLE & LCSD: 2730881 2730882

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1000	956	976	96	98	80-120	2	10	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 502862 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Associated Lab Samples: 10406825004

METHOD BLANK: 2733448 Matrix: Water  
Associated Lab Samples: 10406825004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/17/17 15:06	

LABORATORY CONTROL SAMPLE: 2733449

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	974	97	80-120	

SAMPLE DUPLICATE: 2733450

Parameter	Units	10406686003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	462	494	7	10	

SAMPLE DUPLICATE: 2733451

Parameter	Units	10406825004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	236	259	9	10	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 503199

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10406825005

METHOD BLANK: 2735125

Matrix: Water

Associated Lab Samples: 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/18/17 16:34	

LABORATORY CONTROL SAMPLE: 2735126

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	928	93	80-120	

SAMPLE DUPLICATE: 2735127

Parameter	Units	10406784002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1630	1610	2	10	

SAMPLE DUPLICATE: 2735128

Parameter	Units	10406784003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2100	2280	8	10	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 91816

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

METHOD BLANK: 394776

Matrix: Water

Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	10/14/17 09:58	

LABORATORY CONTROL SAMPLE: 394777

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.22	108	90-110	

MATRIX SPIKE SAMPLE: 394779

Parameter	Units	10406825004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	100	75-125	

SAMPLE DUPLICATE: 394778

Parameter	Units	10406825004 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 502163 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10406825002, 10406825003, 10406825004, 10406825005

METHOD BLANK: 2729315 Matrix: Water

Associated Lab Samples: 10406825002, 10406825003, 10406825004, 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.32J	1.2	0.14	10/12/17 14:27	
Nitrate as N	mg/L	0.041J	0.10	0.0079	10/12/17 14:27	
Sulfate	mg/L	0.46J	1.2	0.27	10/12/17 14:27	

LABORATORY CONTROL SAMPLE: 2729316

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.0	96	90-110	
Nitrate as N	mg/L	1	0.92	92	90-110	
Sulfate	mg/L	12.5	11.6	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2729317 2729318

Parameter	Units	10406825004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	10.3	12.5	12.5	21.0	21.0	86	86	90-110	0	20	M1	
Nitrate as N	mg/L	7.5	1	1	7.5	7.5	0	-1	90-110	0	20	M1	
Sulfate	mg/L	22.1	12.5	12.5	31.5	31.4	75	74	90-110	0	20	M1	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 502447 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004

METHOD BLANK: 2730797 Matrix: Water  
Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/14/17 10:35	FS

LABORATORY CONTROL SAMPLE: 2730798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730801 2730802

Parameter	Units	10406714001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	0.40	1	1	1	1.3	1.4	93	96	90-110	2	20			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2730803 2730804

Parameter	Units	10406825004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	7.8	10	10	10	16.8	16.4	90	86	90-110	2	20	M6		

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 502559 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10406825005

METHOD BLANK: 2731776 Matrix: Water  
Associated Lab Samples: 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/14/17 11:01	

LABORATORY CONTROL SAMPLE: 2731777

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2731778 2731779

Parameter	Units	10406905001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.28	0.28	28	28	90-110	3	20	M3		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2731780 2731781

Parameter	Units	10406907004 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.90	0.88	90	87	90-110	3	20	M1		

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 502653 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

METHOD BLANK: 2732322 Matrix: Water  
 Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004, 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	10/16/17 15:17	

LABORATORY CONTROL SAMPLE: 2732323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	300	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732324 2732325

Parameter	Units	10406955001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Chemical Oxygen Demand	mg/L	5810	2500	2500	8310	8270	100	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732326 2732327

Parameter	Units	10406825004	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Conc.	Result	Result	% Rec	% Rec				
Chemical Oxygen Demand	mg/L	99.5	250	250	338	335	95	94	90-110	1	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

QC Batch: 128859 Analysis Method: SM 5310C  
 QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
 Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004

METHOD BLANK: 512785 Matrix: Water  
 Associated Lab Samples: 10406825001, 10406825002, 10406825003, 10406825004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/18/17 12:59	

LABORATORY CONTROL SAMPLE: 512786

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 512787 512788

Parameter	Units	10406837001		512787		512788		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Total Organic Carbon	mg/L	<1.0	25	25	26.0	26.2	103	104	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 512789 512790

Parameter	Units	10406825004		512789		512790		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Total Organic Carbon	mg/L	19.7	25	25	44.8	45.0	100	101	80-120	1	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

QC Batch: 129160 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10406825005

METHOD BLANK: 514131 Matrix: Water  
Associated Lab Samples: 10406825005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/20/17 14:17	

LABORATORY CONTROL SAMPLE: 514132

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 514133 514134

Parameter	Units	10407039001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Total Organic Carbon	mg/L	<1.0	25	25	26.0	26.4	104	105	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 514135 514136

Parameter	Units	10407275001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Total Organic Carbon	mg/L	3.6	25	25	29.5	29.6	104	104	80-120	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

FS The sample was filtered in the laboratory prior to analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406825

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10406825001	MW5D-GW-101017	RSK 175	502714		
10406825002	MW1D-GW-101017	RSK 175	502714		
10406825003	MW17D-GW-101017	RSK 175	502714		
10406825004	MW7S-GW-101017	RSK 175	502714		
10406825005	WS5-GW-101117	RSK 175	502717		
10406825001	MW5D-GW-101017	EPA 3010	502327	6010C Met	502524
10406825002	MW1D-GW-101017	EPA 3010	502327	6010C Met	502524
10406825003	MW17D-GW-101017	EPA 3010	502327	6010C Met	502524
10406825004	MW7S-GW-101017	EPA 3010	502327	6010C Met	502524
10406825005	WS5-GW-101117	EPA 3010	502327	6010C Met	502524
10406825001	MW5D-GW-101017	EPA 7470A	502342	EPA 7470A	502515
10406825002	MW1D-GW-101017	EPA 7470A	502342	EPA 7470A	502515
10406825003	MW17D-GW-101017	EPA 7470A	502342	EPA 7470A	502515
10406825004	MW7S-GW-101017	EPA 7470A	502342	EPA 7470A	502515
10406825005	WS5-GW-101117	EPA 7470A	502342	EPA 7470A	502515
10406825002	MW1D-GW-101017	SM 2320B	503865		
10406825003	MW17D-GW-101017	SM 2320B	503865		
10406825004	MW7S-GW-101017	SM 2320B	503865		
10406825005	WS5-GW-101117	SM 2320B	503872		
10406825002	MW1D-GW-101017	SM 2540C	502462		
10406825003	MW17D-GW-101017	SM 2540C	502462		
10406825004	MW7S-GW-101017	SM 2540C	502862		
10406825005	WS5-GW-101117	SM 2540C	503199		
10406825001	MW5D-GW-101017	SM 4500-S-2 D	91816		
10406825002	MW1D-GW-101017	SM 4500-S-2 D	91816		
10406825003	MW17D-GW-101017	SM 4500-S-2 D	91816		
10406825004	MW7S-GW-101017	SM 4500-S-2 D	91816		
10406825005	WS5-GW-101117	SM 4500-S-2 D	91816		
10406825002	MW1D-GW-101017	EPA 300.0	502163		
10406825003	MW17D-GW-101017	EPA 300.0	502163		
10406825004	MW7S-GW-101017	EPA 300.0	502163		
10406825005	WS5-GW-101117	EPA 300.0	502163		
10406825001	MW5D-GW-101017	EPA 353.2	502447		
10406825002	MW1D-GW-101017	EPA 353.2	502447		
10406825003	MW17D-GW-101017	EPA 353.2	502447		
10406825004	MW7S-GW-101017	EPA 353.2	502447		
10406825005	WS5-GW-101117	EPA 353.2	502559		
10406825001	MW5D-GW-101017	EPA 410.4	502653	EPA 410.4	502797
10406825002	MW1D-GW-101017	EPA 410.4	502653	EPA 410.4	502797
10406825003	MW17D-GW-101017	EPA 410.4	502653	EPA 410.4	502797
10406825004	MW7S-GW-101017	EPA 410.4	502653	EPA 410.4	502797
10406825005	WS5-GW-101117	EPA 410.4	502653	EPA 410.4	502797

**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406825

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10406825001	MW5D-GW-101017	SM 5310C	128859		
10406825002	MW1D-GW-101017	SM 5310C	128859		
10406825003	MW17D-GW-101017	SM 5310C	128859		
10406825004	MW7S-GW-101017	SM 5310C	128859		
10406825005	WS5-GW-101117	SM 5310C	129160		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10406825

Page: 1 Of 1

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone:		Purchase Order # PEDD# 1497		Pace Quote: Contract# 758938	
Requested Due Date: 10 Day Standard		Project Name: Freeman WA-Grain Handling Facility		Pace Project Manager: Jennifer Gross	
Fax:		Project #: 1497		Pace Profile #: 36447 / 4	

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test Y/N	Requested Analysis Filtered (Y/N)											MS/MSD Requested												
				START DATE	END DATE			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8260	60107470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2														
																									DATE		TIME	DATE	TIME									
1	MW50-GW-101017	WT/G		10/11/17	9:25	8	4	2	1	1																												001
2	MW10-GW-101017				12:30																																002	
3	MW170-GW-101017				1:40																															003		
4	MW75-GW-101017				14:05																															004		
5	WS5-GW-101117				8:10																															005		
6																																						
7																																						
8																																						
9																																						
10																																						
11																																						
12																																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Short hold analyses are in bold	JR A / CH2M	10-11-17	16:00	Steve Demus	10-11-17	9:35	2.0	3.1	Y	Y	N
*Field filtered by client											

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Steve Demus					
SIGNATURE of SAMPLER:	JR A	DATE Signed:	10-11-17			

**Sample Condition Upon Receipt - ESI Tech Specs** **Client Name:** CH2K Hill - UPR2 **Project #:** WO# : 10406825

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

**Tracking Number:** 744810326639, 744810326640

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: Pb **Temp Blank?**  Yes  No

**Thermometer**  151401163 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun  
**Used:**  687A9155100842

**Cooler Temp Read (°C):** 3.033 **Cooler Temp Corrected (°C):** 2.831 **Biological Tissue Frozen?**  Yes  No  N/A  
**Temp should be above freezing to 6°C** **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** 10/12/17

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. <u>See exception sheet</u>
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-3, 5</u> <u>4</u> <u>3/3</u> <u>3/3</u> <u>3/3</u>
Exceptions: VOA, Coliform, TOC, DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. <u>See exception for RSK</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?**  Yes  No

Person Contacted: Steve Demus Date/Time: 10/12/17

Comments/Resolution: Notified client of broken RSK vials and insufficient volume for MW5D.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	<u>MW17D and MW7S RSK vials are still usable by the lab.</u>
Opened Time: <u>1020</u> Temp: <u>3.0</u> Corrected Temp: <u>2.8</u>	
Time: <u>1140</u> put in cooler	
Time: _____ Temp: _____ Corrected Temp: _____	

**Project Manager Review:** JENNI GROSS **Date:** 10/12/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





Document Name:  
Sample Condition Upon Receipt Form

Document No.:  
F-MN-L-213-rev.21

Document Revised: 30Aug2017  
Page 2 of 2

Issuing Authority:  
Pace Minnesota Quality Office

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
container came broken	MWSD-6W-10/017	2/3 USG
lid came off in cooler, not sufficient volume.	MWSD-6W-10/017	1/1 BP2U
no heads, seal in RSK vials	MW17D-6W-10/017	3/3 USG
no heads, seal in RSK vials	<del>MW17D</del> MW7S-6W-10/017	1/9 USG

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

Chain of Custody

**WO# : 1298802**

PM: HRZ Due Date: 10/27/17  
CLIENT: PACE MPLS



Workorder: 10406825 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 10/12/2017 Results Requested By: 10/26/2017

Report To		Subcontract To					Requested Analysis																										
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					5632354 / 5310 TOC																										
																			Preserved Containers							LAB USE ONLY							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4																											
1	MW5D-GW-101017	PS	10/10/2017 09:25	10406825001	Water	1																											
2	MW1D-GW-101017	PS	10/10/2017 12:30	10406825002	Water	1																											
3	MW17D-GW-101017	PS	10/10/2017 15:40	10406825003	Water	1																											
4	MW7S-GW-101017	RQS	10/10/2017 14:05	10406825004	Water	3																											
5	WS5-GW-101117	PS	10/11/2017 08:10	10406825005	Water	1																											
Transfers		Released By		Date/Time	Received By														Date/Time					Comments									
1		Pace MN		10/12/17 15:30	[Signature]														10/12/17 15:05														
2		[Signature]		10/12/17 21:10	[Signature]		10/13/17 08:20																										
3																																	
Cooler Temperature on Receipt			2.5 °C	Custody Seal			Y	or		N	Received on Ice			Y	or		N	Samples Intact			Y	or		N									

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MLV Project #: \_\_\_\_\_

**WO#: 1298802**  
 PM: HRZ Due Date: 10/27/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: HO2 Pac Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.2 Cooler Temp Corrected °C: 2.5 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 0.7 Date and Initials of Person Examining Contents: JMC 10/17/17

Comments: 10/13/17 dl

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 10-13-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





# Sample Condition Upon **WO# : 2063300**

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Pr

PM: CMM

Due Date: 10/26/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:

- Therm Fisher IR 5
- Therm Fisher IR 6
- Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10/13/17 mb

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	<u>500 plastic</u>
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

October 24, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

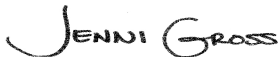
RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10406829

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 12, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
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## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10406829001	MW5D-GW-101017	Water	10/10/17 09:25	10/12/17 09:35
10406829002	MW1D-GW-101017	Water	10/10/17 12:30	10/12/17 09:35
10406829003	MW17D-GW-101017	Water	10/10/17 13:40	10/12/17 09:35
10406829004	MW7S-GW-101017	Water	10/10/17 14:05	10/12/17 09:35
10406829005	WS5-GW-101117	Water	10/11/17 08:10	10/12/17 09:35
10406829006	Trip Blank	Water	10/10/17 00:00	10/12/17 09:35

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10406829001	MW5D-GW-101017	EPA 8260B	DJB	83	PASI-M
10406829002	MW1D-GW-101017	EPA 8260B	DJB	83	PASI-M
10406829003	MW17D-GW-101017	EPA 8260B	DJB	83	PASI-M
10406829004	MW7S-GW-101017	EPA 8260B	DJB	83	PASI-M
10406829005	WS5-GW-101117	EPA 8260B	DJB	83	PASI-M
10406829006	Trip Blank	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10406829001</b>	<b>MW5D-GW-101017</b>					
EPA 8260B	Acetone	21.6	ug/L	20.0	10/20/17 21:48	
<b>10406829002</b>	<b>MW1D-GW-101017</b>					
EPA 8260B	Acetone	30.9	ug/L	20.0	10/20/17 22:12	
<b>10406829003</b>	<b>MW17D-GW-101017</b>					
EPA 8260B	Acetone	35.6	ug/L	20.0	10/20/17 22:35	
EPA 8260B	Carbon disulfide	3.0	ug/L	1.0	10/20/17 22:35	
<b>10406829004</b>	<b>MW7S-GW-101017</b>					
EPA 8260B	Acetone	32.3	ug/L	20.0	10/20/17 21:25	M1
EPA 8260B	Carbon tetrachloride	1.3	ug/L	0.50	10/20/17 21:25	
EPA 8260B	Toluene	0.21J	ug/L	0.50	10/20/17 21:25	
<b>10406829005</b>	<b>WS5-GW-101117</b>					
EPA 8260B	Acetone	34.6	ug/L	20.0	10/20/17 22:59	
EPA 8260B	Carbon tetrachloride	8.1	ug/L	0.50	10/20/17 22:59	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 24, 2017

**General Information:**

6 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 503783

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10406829004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2738774)
  - Tetrahydrofuran
- MSD (Lab ID: 2738775)
  - Acetone
  - Tetrahydrofuran

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Sample: MW5D-GW-101017 Lab ID: 10406829001 Collected: 10/10/17 09:25 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 21:48	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/20/17 21:48	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/20/17 21:48	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/20/17 21:48	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:48	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:48	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/20/17 21:48	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:48	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/20/17 21:48	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/20/17 21:48	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/20/17 21:48	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/20/17 21:48	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 21:48	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/20/17 21:48	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/20/17 21:48	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:48	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 21:48	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/20/17 21:48	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/20/17 21:48	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/20/17 21:48	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/20/17 21:48	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/20/17 21:48	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/20/17 21:48	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/20/17 21:48	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/20/17 21:48	108-10-1	
Acetone	21.6	ug/L	20.0	8.8	1		10/20/17 21:48	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/20/17 21:48	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/20/17 21:48	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 21:48	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 21:48	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/20/17 21:48	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/20/17 21:48	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/20/17 21:48	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/20/17 21:48	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/20/17 21:48	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/20/17 21:48	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/20/17 21:48	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/20/17 21:48	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: MW5D-GW-101017**      **Lab ID: 10406829001**      Collected: 10/10/17 09:25      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/20/17 21:48	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/20/17 21:48	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 21:48	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/20/17 21:48	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/20/17 21:48	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/20/17 21:48	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/20/17 21:48	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/20/17 21:48	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/20/17 21:48	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/20/17 21:48	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/20/17 21:48	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/20/17 21:48	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/20/17 21:48	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/20/17 21:48	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/20/17 21:48	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/20/17 21:48	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/20/17 21:48	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/20/17 21:48	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/20/17 21:48	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/20/17 21:48	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 21:48	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/20/17 21:48	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:48	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 21:48	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/20/17 21:48	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/20/17 21:48	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/20/17 21:48	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/20/17 21:48	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/20/17 21:48	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/20/17 21:48	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		10/20/17 21:48	17060-07-0	HS
Toluene-d8 (S)	99	%	75-125		1		10/20/17 21:48	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/20/17 21:48	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Sample: **MW1D-GW-101017** Lab ID: **10406829002** Collected: 10/10/17 12:30 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 22:12	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/20/17 22:12	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/20/17 22:12	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/20/17 22:12	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:12	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:12	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/20/17 22:12	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:12	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/20/17 22:12	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/20/17 22:12	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/20/17 22:12	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/20/17 22:12	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 22:12	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/20/17 22:12	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/20/17 22:12	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:12	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:12	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/20/17 22:12	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/20/17 22:12	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/20/17 22:12	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/20/17 22:12	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/20/17 22:12	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/20/17 22:12	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/20/17 22:12	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/20/17 22:12	108-10-1	
Acetone	30.9	ug/L	20.0	8.8	1		10/20/17 22:12	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/20/17 22:12	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/20/17 22:12	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:12	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 22:12	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/20/17 22:12	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/20/17 22:12	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/20/17 22:12	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/20/17 22:12	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/20/17 22:12	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/20/17 22:12	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/20/17 22:12	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/20/17 22:12	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	124-48-1	

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: MW1D-GW-101017**      **Lab ID: 10406829002**      Collected: 10/10/17 12:30      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/20/17 22:12	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/20/17 22:12	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 22:12	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/20/17 22:12	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/20/17 22:12	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/20/17 22:12	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/20/17 22:12	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/20/17 22:12	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/20/17 22:12	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:12	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/20/17 22:12	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/20/17 22:12	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/20/17 22:12	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/20/17 22:12	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/20/17 22:12	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/20/17 22:12	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/20/17 22:12	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/20/17 22:12	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/20/17 22:12	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:12	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 22:12	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/20/17 22:12	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:12	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 22:12	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/20/17 22:12	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/20/17 22:12	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/20/17 22:12	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/20/17 22:12	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/20/17 22:12	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/20/17 22:12	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		10/20/17 22:12	17060-07-0	HS
Toluene-d8 (S)	100	%	75-125		1		10/20/17 22:12	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		10/20/17 22:12	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Sample: MW17D-GW-101017 Lab ID: 10406829003 Collected: 10/10/17 13:40 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 22:35	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/20/17 22:35	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/20/17 22:35	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/20/17 22:35	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:35	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:35	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/20/17 22:35	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:35	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/20/17 22:35	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/20/17 22:35	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/20/17 22:35	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/20/17 22:35	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 22:35	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/20/17 22:35	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/20/17 22:35	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:35	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:35	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/20/17 22:35	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/20/17 22:35	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/20/17 22:35	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/20/17 22:35	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/20/17 22:35	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/20/17 22:35	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/20/17 22:35	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/20/17 22:35	108-10-1	
Acetone	35.6	ug/L	20.0	8.8	1		10/20/17 22:35	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/20/17 22:35	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/20/17 22:35	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:35	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 22:35	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/20/17 22:35	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/20/17 22:35	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/20/17 22:35	74-83-9	
Carbon disulfide	3.0	ug/L	1.0	0.37	1		10/20/17 22:35	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/20/17 22:35	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/20/17 22:35	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/20/17 22:35	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/20/17 22:35	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: MW17D-GW-101017**      **Lab ID: 10406829003**      Collected: 10/10/17 13:40      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/20/17 22:35	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/20/17 22:35	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 22:35	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/20/17 22:35	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/20/17 22:35	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/20/17 22:35	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/20/17 22:35	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/20/17 22:35	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/20/17 22:35	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:35	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/20/17 22:35	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/20/17 22:35	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/20/17 22:35	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/20/17 22:35	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/20/17 22:35	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/20/17 22:35	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/20/17 22:35	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/20/17 22:35	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/20/17 22:35	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:35	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 22:35	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/20/17 22:35	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:35	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 22:35	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/20/17 22:35	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/20/17 22:35	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/20/17 22:35	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/20/17 22:35	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/20/17 22:35	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/20/17 22:35	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		10/20/17 22:35	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/20/17 22:35	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		10/20/17 22:35	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Sample: **MW7S-GW-101017** Lab ID: **10406829004** Collected: 10/10/17 14:05 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 21:25	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/20/17 21:25	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/20/17 21:25	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/20/17 21:25	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:25	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:25	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/20/17 21:25	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:25	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/20/17 21:25	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/20/17 21:25	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/20/17 21:25	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/20/17 21:25	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 21:25	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/20/17 21:25	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/20/17 21:25	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 21:25	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 21:25	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/20/17 21:25	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/20/17 21:25	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/20/17 21:25	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/20/17 21:25	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/20/17 21:25	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/20/17 21:25	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/20/17 21:25	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/20/17 21:25	108-10-1	
Acetone	32.3	ug/L	20.0	8.8	1		10/20/17 21:25	67-64-1	M1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/20/17 21:25	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/20/17 21:25	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 21:25	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 21:25	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/20/17 21:25	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/20/17 21:25	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/20/17 21:25	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/20/17 21:25	75-15-0	
Carbon tetrachloride	1.3	ug/L	0.50	0.20	1		10/20/17 21:25	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/20/17 21:25	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/20/17 21:25	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/20/17 21:25	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	124-48-1	

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: MW7S-GW-101017**      **Lab ID: 10406829004**      Collected: 10/10/17 14:05      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/20/17 21:25	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/20/17 21:25	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 21:25	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/20/17 21:25	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/20/17 21:25	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/20/17 21:25	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/20/17 21:25	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/20/17 21:25	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/20/17 21:25	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/20/17 21:25	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/20/17 21:25	109-99-9	M1
Toluene	0.21J	ug/L	0.50	0.17	1		10/20/17 21:25	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/20/17 21:25	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/20/17 21:25	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/20/17 21:25	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/20/17 21:25	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/20/17 21:25	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/20/17 21:25	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/20/17 21:25	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/20/17 21:25	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 21:25	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/20/17 21:25	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/20/17 21:25	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 21:25	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/20/17 21:25	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/20/17 21:25	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/20/17 21:25	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/20/17 21:25	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/20/17 21:25	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/20/17 21:25	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		10/20/17 21:25	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/20/17 21:25	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		10/20/17 21:25	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Sample: **WS5-GW-101117** Lab ID: **10406829005** Collected: 10/11/17 08:10 Received: 10/12/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 22:59	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/20/17 22:59	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/20/17 22:59	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/20/17 22:59	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:59	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:59	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/20/17 22:59	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:59	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/20/17 22:59	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/20/17 22:59	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/20/17 22:59	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/20/17 22:59	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 22:59	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/20/17 22:59	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/20/17 22:59	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 22:59	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:59	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/20/17 22:59	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/20/17 22:59	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/20/17 22:59	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/20/17 22:59	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/20/17 22:59	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/20/17 22:59	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/20/17 22:59	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/20/17 22:59	108-10-1	
Acetone	34.6	ug/L	20.0	8.8	1		10/20/17 22:59	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/20/17 22:59	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/20/17 22:59	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:59	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 22:59	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/20/17 22:59	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/20/17 22:59	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/20/17 22:59	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/20/17 22:59	75-15-0	
Carbon tetrachloride	8.1	ug/L	0.50	0.20	1		10/20/17 22:59	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/20/17 22:59	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/20/17 22:59	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/20/17 22:59	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	124-48-1	

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: WS5-GW-101117**      **Lab ID: 10406829005**      Collected: 10/11/17 08:10      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/20/17 22:59	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/20/17 22:59	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 22:59	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/20/17 22:59	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/20/17 22:59	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/20/17 22:59	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/20/17 22:59	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/20/17 22:59	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/20/17 22:59	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/20/17 22:59	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/20/17 22:59	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/20/17 22:59	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/20/17 22:59	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/20/17 22:59	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/20/17 22:59	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/20/17 22:59	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/20/17 22:59	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/20/17 22:59	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/20/17 22:59	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/20/17 22:59	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 22:59	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/20/17 22:59	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/20/17 22:59	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 22:59	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/20/17 22:59	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/20/17 22:59	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/20/17 22:59	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/20/17 22:59	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/20/17 22:59	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/20/17 22:59	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		10/20/17 22:59	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/20/17 22:59	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		10/20/17 22:59	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: Trip Blank**      **Lab ID: 10406829006**      Collected: 10/10/17 00:00      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 20:14	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/20/17 20:14	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/20/17 20:14	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/20/17 20:14	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/20/17 20:14	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/20/17 20:14	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/20/17 20:14	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 20:14	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/20/17 20:14	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/20/17 20:14	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/20/17 20:14	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/20/17 20:14	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/20/17 20:14	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/20/17 20:14	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/20/17 20:14	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/20/17 20:14	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 20:14	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/20/17 20:14	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/20/17 20:14	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/20/17 20:14	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/20/17 20:14	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/20/17 20:14	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/20/17 20:14	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/20/17 20:14	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/20/17 20:14	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		10/20/17 20:14	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/20/17 20:14	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/20/17 20:14	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/20/17 20:14	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 20:14	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/20/17 20:14	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/20/17 20:14	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/20/17 20:14	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/20/17 20:14	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/20/17 20:14	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/20/17 20:14	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/20/17 20:14	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/20/17 20:14	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

**Sample: Trip Blank**      **Lab ID: 10406829006**      Collected: 10/10/17 00:00      Received: 10/12/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/20/17 20:14	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/20/17 20:14	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/20/17 20:14	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/20/17 20:14	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/20/17 20:14	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/20/17 20:14	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/20/17 20:14	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/20/17 20:14	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/20/17 20:14	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/20/17 20:14	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/20/17 20:14	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/20/17 20:14	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/20/17 20:14	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/20/17 20:14	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/20/17 20:14	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/20/17 20:14	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/20/17 20:14	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/20/17 20:14	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/20/17 20:14	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/20/17 20:14	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 20:14	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/20/17 20:14	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/20/17 20:14	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/20/17 20:14	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/20/17 20:14	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/20/17 20:14	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/20/17 20:14	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/20/17 20:14	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/20/17 20:14	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/20/17 20:14	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		10/20/17 20:14	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/20/17 20:14	2037-26-5	
4-Bromofluorobenzene (S)	107	%	75-125		1		10/20/17 20:14	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

QC Batch: 503783 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10406829001, 10406829002, 10406829003, 10406829004, 10406829005, 10406829006

METHOD BLANK: 2738772 Matrix: Water  
Associated Lab Samples: 10406829001, 10406829002, 10406829003, 10406829004, 10406829005, 10406829006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/20/17 19:28	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/20/17 19:28	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/20/17 19:28	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/20/17 19:28	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/20/17 19:28	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/20/17 19:28	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/20/17 19:28	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/20/17 19:28	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	10/20/17 19:28	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/20/17 19:28	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/20/17 19:28	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/20/17 19:28	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/20/17 19:28	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/20/17 19:28	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/20/17 19:28	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/20/17 19:28	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/20/17 19:28	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/20/17 19:28	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/20/17 19:28	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/20/17 19:28	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/20/17 19:28	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/20/17 19:28	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/20/17 19:28	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/20/17 19:28	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/20/17 19:28	
Acetone	ug/L	<8.8	20.0	8.8	10/20/17 19:28	
Acrolein	ug/L	<4.8	10.0	4.8	10/20/17 19:28	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/20/17 19:28	
Benzene	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/20/17 19:28	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/20/17 19:28	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/20/17 19:28	
Bromoform	ug/L	<1.0	4.0	1.0	10/20/17 19:28	
Bromomethane	ug/L	<1.5	4.0	1.5	10/20/17 19:28	
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/20/17 19:28	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/20/17 19:28	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

METHOD BLANK: 2738772

Matrix: Water

Associated Lab Samples: 10406829001, 10406829002, 10406829003, 10406829004, 10406829005, 10406829006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
Chloroethane	ug/L	<0.44	1.0	0.44	10/20/17 19:28	
Chloroform	ug/L	<0.46	1.0	0.46	10/20/17 19:28	
Chloromethane	ug/L	<1.1	4.0	1.1	10/20/17 19:28	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/20/17 19:28	
cis-1,3-Dichloropropene	ug/L	<0.12	1.0	0.12	10/20/17 19:28	MN
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/20/17 19:28	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/20/17 19:28	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/20/17 19:28	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/20/17 19:28	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/20/17 19:28	
Isopropylbenzene (Cumene)	ug/L	<0.14	1.0	0.14	10/20/17 19:28	MN
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/20/17 19:28	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/20/17 19:28	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/20/17 19:28	
Naphthalene	ug/L	<0.42	1.0	0.42	10/20/17 19:28	
o-Xylene	ug/L	<0.11	0.50	0.11	10/20/17 19:28	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	10/20/17 19:28	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/20/17 19:28	
Styrene	ug/L	<0.14	1.0	0.14	10/20/17 19:28	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/20/17 19:28	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/20/17 19:28	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/20/17 19:28	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/20/17 19:28	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/20/17 19:28	
Toluene	ug/L	<0.17	0.50	0.17	10/20/17 19:28	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/20/17 19:28	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	10/20/17 19:28	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/20/17 19:28	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/20/17 19:28	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/20/17 19:28	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/20/17 19:28	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/20/17 19:28	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/20/17 19:28	
1,2-Dichloroethane-d4 (S)	%	103	75-137		10/20/17 19:28	
4-Bromofluorobenzene (S)	%	105	75-125		10/20/17 19:28	
Toluene-d8 (S)	%	101	75-125		10/20/17 19:28	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

LABORATORY CONTROL SAMPLE: 2738773

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.8	104	75-136	
1,1,1-Trichloroethane	ug/L	20	19.1	96	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	21.5	107	71-138	
1,1,2-Trichloroethane	ug/L	20	22.2	111	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.4	102	69-126	
1,1-Dichloroethane	ug/L	20	19.6	98	75-125	
1,1-Dichloroethene	ug/L	20	19.4	97	75-125	
1,1-Dichloropropene	ug/L	20	19.8	99	75-125	
1,2,3-Trichlorobenzene	ug/L	20	22.2	111	75-125	
1,2,3-Trichloropropane	ug/L	20	22.0	110	75-125	
1,2,4-Trichlorobenzene	ug/L	20	21.8	109	75-125	
1,2,4-Trimethylbenzene	ug/L	20	21.0	105	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	49.1	98	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.0	105	75-125	
1,2-Dichlorobenzene	ug/L	20	20.4	102	75-125	
1,2-Dichloroethane	ug/L	20	19.1	95	70-125	
1,2-Dichloroethene (Total)	ug/L	40	38.7	97	75-125	
1,2-Dichloropropane	ug/L	20	20.3	102	75-125	
1,3,5-Trimethylbenzene	ug/L	20	23.4	117	75-125	
1,3-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,3-Dichloropropane	ug/L	20	21.2	106	75-125	
1,4-Dichlorobenzene	ug/L	20	21.4	107	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	387	97	64-140	
2,2,4-Trimethylpentane	ug/L	20	21.4	107	68-125	
2,2-Dichloropropane	ug/L	20	18.1	91	70-131	
2-Butanone (MEK)	ug/L	100	96.3	96	69-125	
2-Chlorotoluene	ug/L	20	21.1	106	75-125	
2-Hexanone	ug/L	100	111	111	73-129	
4-Chlorotoluene	ug/L	20	21.6	108	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	112	112	73-125	
Acetone	ug/L	100	101	101	66-126	
Acrolein	ug/L	200	194	97	56-150	
Acrylonitrile	ug/L	200	194	97	68-129	
Benzene	ug/L	20	20.7	104	75-125	
Bromobenzene	ug/L	20	21.2	106	75-125	
Bromochloromethane	ug/L	20	18.7	93	75-126	
Bromodichloromethane	ug/L	20	21.4	107	75-133	
Bromoform	ug/L	20	19.8	99	62-142	
Bromomethane	ug/L	20	20.8	104	34-143	
Carbon disulfide	ug/L	20	16.9	85	71-125	
Carbon tetrachloride	ug/L	20	19.4	97	71-145	
Chlorobenzene	ug/L	20	20.5	103	75-125	
Chloroethane	ug/L	20	20.8	104	75-125	
Chloroform	ug/L	20	19.4	97	75-125	
Chloromethane	ug/L	20	19.5	97	54-125	
cis-1,2-Dichloroethene	ug/L	20	19.9	99	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

LABORATORY CONTROL SAMPLE: 2738773

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	19.6	98	74-141	
Dibromomethane	ug/L	20	21.0	105	75-125	
Dichlorodifluoromethane	ug/L	20	20.6	103	59-130	
Dichlorofluoromethane	ug/L	20	20.1	101	75-125	
Diisopropyl ether	ug/L	20	19.3	96	69-125	
Ethyl-tert-butyl ether	ug/L	20	20.4	102	73-125	
Ethylbenzene	ug/L	20	21.4	107	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.5	113	75-131	
Isopropylbenzene (Cumene)	ug/L	20	20.2	101	75-125	
m&p-Xylene	ug/L	40	44.1	110	75-125	
Methyl-tert-butyl ether	ug/L	20	19.8	99	75-125	
Methylene Chloride	ug/L	20	19.2	96	73-125	
n-Butylbenzene	ug/L	20	21.8	109	75-125	
n-Propylbenzene	ug/L	20	22.5	112	75-125	
Naphthalene	ug/L	20	20.4	102	74-125	
o-Xylene	ug/L	20	20.4	102	75-125	
p-Isopropyltoluene	ug/L	20	21.9	110	75-125	
sec-Butylbenzene	ug/L	20	22.0	110	75-125	
Styrene	ug/L	20	20.2	101	75-125	
tert-Amylmethyl ether	ug/L	20	20.3	101	71-126	
tert-Butyl Alcohol	ug/L	200	195	98	69-131	
tert-Butylbenzene	ug/L	20	23.1	116	75-125	
Tetrachloroethene	ug/L	20	20.6	103	75-125	
Tetrahydrofuran	ug/L	200	185	92	65-127	
Toluene	ug/L	20	19.4	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.8	99	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.2	98	30-150	
Trichloroethene	ug/L	20	21.0	105	75-125	
Trichlorofluoromethane	ug/L	20	20.0	100	71-140	
Vinyl acetate	ug/L	20	19.3	96	68-137	
Vinyl chloride	ug/L	20	23.2	116	70-125	
Xylene (Total)	ug/L	60	64.4	107	75-125	
1,2-Dichloroethane-d4 (S)	%			94	75-137	
4-Bromofluorobenzene (S)	%			103	75-125	
Toluene-d8 (S)	%			105	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2738774 2738775

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10406829004 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	18.2	17.5	91	88	75-137	4	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	20	19.5	18.0	97	90	75-139	8	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	18.1	18.0	91	90	60-142	1	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20	18.6	18.0	93	90	75-128	4	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Parameter	Units	10406829004		2738774		2738775		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	20.9	19.0	105	95	62-150	9	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	19.4	17.1	97	85	70-129	13	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	19.2	17.1	96	86	67-141	11	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	19.6	18.1	98	91	64-144	8	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.3	20.1	106	100	66-139	6	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	18.4	17.9	92	89	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	19.4	18.7	97	94	65-138	4	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	18.6	17.8	93	89	65-143	5	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	44.2	44.4	88	89	61-134	1	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.5	17.7	93	88	74-129	5	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	17.6	17.2	88	86	68-135	2	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	16.9	16.7	85	83	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	38.4	34.1	96	85	69-134	12	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	18.8	17.6	94	88	64-130	7	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	19.9	19.1	100	96	64-146	4	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	18.6	17.3	93	87	69-135	7	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	18.2	17.4	91	87	67-128	5	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	18.6	17.8	93	89	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	344	319	86	80	58-140	8	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	22.6	21.3	113	106	48-150	6	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	20.3	18.7	101	94	50-150	8	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	88.4	80.5	88	80	58-125	9	30		
2-Chlorotoluene	ug/L	<0.20	20	20	18.0	17.7	90	88	65-138	2	30		
2-Hexanone	ug/L	<2.5	100	100	98.8	95.0	97	93	61-134	4	30		
4-Chlorotoluene	ug/L	<0.13	20	20	18.9	18.2	94	91	68-135	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	96.1	90.8	96	91	61-130	6	30		
Acetone	ug/L	32.3	100	100	171	186	138	154	51-140	9	30	M1	
Acrolein	ug/L	<4.8	200	200	179	164	89	82	48-150	9	30		
Acrylonitrile	ug/L	<4.9	200	200	183	162	92	81	55-134	12	30		
Benzene	ug/L	<0.13	20	20	18.3	18.0	91	90	63-132	2	30		
Bromobenzene	ug/L	<0.16	20	20	18.2	17.9	91	90	67-138	1	30		
Bromochloromethane	ug/L	<0.38	20	20	17.5	15.7	87	79	66-138	11	30		
Bromodichloromethane	ug/L	<0.20	20	20	19.3	18.5	96	93	75-137	4	30		
Bromoform	ug/L	<1.0	20	20	17.1	16.1	85	81	65-129	6	30		
Bromomethane	ug/L	<1.5	20	20	21.8	17.6	109	88	41-150	22	30		
Carbon disulfide	ug/L	<0.37	20	20	16.9	14.8	84	74	72-132	13	30		
Carbon tetrachloride	ug/L	1.3	20	20	20.5	19.2	96	90	75-150	7	30		
Chlorobenzene	ug/L	<0.14	20	20	18.3	17.7	91	89	73-127	3	30		
Chloroethane	ug/L	<0.44	20	20	22.6	17.6	113	88	74-138	25	30		
Chloroform	ug/L	<0.46	20	20	18.6	16.9	93	85	74-125	9	30		
Chloromethane	ug/L	<1.1	20	20	20.6	17.3	102	85	58-129	18	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	19.9	17.3	99	86	63-135	14	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	17.3	16.5	87	83	66-129	5	30		
Dibromochloromethane	ug/L	<0.13	20	20	17.0	16.6	85	83	75-133	2	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2738774												2738775											
Parameter	Units	10406829004		MS	MSD	MS		MSD		% Rec		Max		Qual									
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD											
Dibromomethane	ug/L	<0.50	20	20	20	18.9	18.0	95	90	68-134	5	30											
Dichlorodifluoromethane	ug/L	<0.31	20	20	20	23.4	19.3	117	96	72-150	19	30											
Dichlorofluoromethane	ug/L	<0.38	20	20	20	21.5	17.7	108	88	75-129	20	30											
Diisopropyl ether	ug/L	<0.12	20	20	20	17.9	15.8	89	79	62-128	12	30											
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	20	18.5	16.2	92	81	63-132	13	30											
Ethylbenzene	ug/L	<0.14	20	20	20	19.7	18.9	98	94	72-130	4	30											
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	20	25.9	26.0	130	130	71-150	0	30											
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20	18.3	17.2	92	86	70-136	6	30											
m&p-Xylene	ug/L	<0.24	40	40	40	40.1	38.3	100	95	64-142	5	30											
Methyl-tert-butyl ether	ug/L	<0.14	20	20	20	17.6	16.0	88	80	72-125	10	30											
Methylene Chloride	ug/L	<1.2	20	20	20	17.4	16.0	87	80	60-132	8	30											
n-Butylbenzene	ug/L	<0.13	20	20	20	20.6	19.6	103	98	60-150	5	30											
n-Propylbenzene	ug/L	<0.12	20	20	20	19.7	19.3	99	96	63-142	2	30											
Naphthalene	ug/L	<0.42	20	20	20	20.2	19.1	101	95	67-125	6	30											
o-Xylene	ug/L	<0.11	20	20	20	18.5	17.6	92	88	60-143	5	30											
p-Isopropyltoluene	ug/L	<0.14	20	20	20	19.8	19.2	99	96	64-146	3	30											
sec-Butylbenzene	ug/L	<0.12	20	20	20	19.8	19.2	99	96	67-144	3	30											
Styrene	ug/L	<0.14	20	20	20	17.8	17.0	89	85	67-136	5	30											
tert-Amylmethyl ether	ug/L	<0.12	20	20	20	17.0	16.4	85	82	60-134	4	30											
tert-Butyl Alcohol	ug/L	<2.2	200	200	200	179	165	90	83	56-146	8	30											
tert-Butylbenzene	ug/L	<0.15	20	20	20	20.6	19.7	103	99	68-135	4	30											
Tetrachloroethene	ug/L	<0.16	20	20	20	18.2	17.7	91	88	67-148	3	30											
Tetrahydrofuran	ug/L	<4.3	200	200	200	292	285	146	142	51-141	2	30	M1										
Toluene	ug/L	0.21J	20	20	20	17.2	16.6	85	82	61-140	4	30											
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	20	18.5	16.8	93	84	62-138	10	30											
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	20	17.3	16.7	87	84	67-134	4	30											
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	50	44.8	43.6	90	87	30-150	3	30											
Trichloroethene	ug/L	<0.18	20	20	20	19.7	18.4	98	92	64-149	7	30											
Trichlorofluoromethane	ug/L	<0.13	20	20	20	22.8	18.6	114	93	75-150	20	30											
Vinyl acetate	ug/L	<1.5	20	20	20	18.0	16.1	90	80	49-143	11	30											
Vinyl chloride	ug/L	<0.096	20	20	20	25.3	20.8	127	104	75-133	20	30											
Xylene (Total)	ug/L	<0.24	60	60	60	58.6	56.0	98	93	63-142	5	30											
1,2-Dichloroethane-d4 (S)	%							94	95	75-137													
4-Bromofluorobenzene (S)	%							100	105	75-125													
Toluene-d8 (S)	%							101	101	75-125													

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10406829

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10406829001	MW5D-GW-101017	EPA 8260B	503783		
10406829002	MW1D-GW-101017	EPA 8260B	503783		
10406829003	MW17D-GW-101017	EPA 8260B	503783		
10406829004	MW7S-GW-101017	EPA 8260B	503783		
10406829005	WS5-GW-101117	EPA 8260B	503783		
10406829006	Trip Blank	EPA 8260B	503783		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10406829

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Page: <u>1</u> Of <u>1</u>	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh		Regulatory Agency	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR		State / Location	
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221		WA / Freeman	
Phone:		Purchase Order # PEDD# 1497		Pace Quote: Contract# 758938			
Requested Due Date: <b>10 Day Standard</b>		Project Name: Freeman WA-Grain Handling Facility		Pace Project Manager: Jennifer Gross			
		Project #: 1497		Pace Profile #: 36447 / 4			

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test	Y/N	Requested Analysis Filtered (Y/N)	MS/MSD Requested	MS/MSD										
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other						Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 8310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 853.2
						DATE	TIME	DATE	TIME																							
1	MW5D-GW-101017			WT	G			10/11/17	9:25		3				3										001							
2	MW1D-GW-101017								10:30		3				3										002							
3	MW7D-GW-101017								13:40		2				2										003							
4	MW7S-GW-101017								14:05		6				6										ms/msd 004							
5	WS5-GW-101117							10/11/17	8:10		3				3										005							
6	Trip Blank										2				2										006							
7																																
8																																
9																																
10																																
11																																
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	<i>[Signature]</i> CH2M	10-11-17	10:00	<i>[Signature]</i> PACE	10-11-17	9:35	2.0 3.1 4 4 4
*Field filtered by client					10-12-17	JMG	

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<i>Steve Demus</i>					
SIGNATURE of SAMPLER:	<i>[Signature]</i>	DATE Signed:	10-11-17			

**Sample Condition Upon Receipt - ESI Tech Specs** Client Name: CH2K Hill - UPR 2 Project #: **WO#: 10406829**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 744810326035, 744810326040

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: Pb Temp Blank?  Yes  No

Thermometer Used:  151401163  687A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.033 Cooler Temp Corrected (°C): 2.831 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: -0.2 Date and Initials of Person Examining Contents: LOT 10/12/17

USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.


		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA/Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>See exception sheet</u>
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>N/A</u>		

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: Steve Demus Date/Time: 10/12/17 12:46

Comments/Resolution: Notified client of headspace in voa vials, per Steve, proceed.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1020</u>	Temp: <u>3.0</u>	Corrected Temp: <u>2.6</u>
Time: <u>1040</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: JENNI GROSS Date: 10/12/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

	Document Name: <b>Sample Condition Upon Receipt Form</b>	Document Revised: 30Aug2017 Page 2 of 2
	Document No.: <b>F-MN-L-213-rev.21</b>	Issuing Authority: Pace Minnesota Quality Office

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
<i>healyard byer from bronca</i>	<i>MWSD-GW-101017</i>	<i>3/3 U6911</i>
<i>" " "</i>	<i>MWD-GW-101017</i>	<i>" "</i>

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

October 30, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

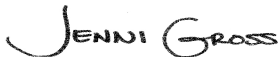
RE: Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Montana Certificate #CERT0103

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10407193001	MW1S-GW-101217	Water	10/12/17 14:10	10/14/17 09:15
10407193002	MW9S-GW-101217	Water	10/12/17 13:40	10/14/17 09:15
10407193003	MW8S-GW-101217	Water	10/12/17 13:20	10/14/17 09:15
10407193004	MW10S-GW-101217	Water	10/12/17 12:15	10/14/17 09:15
10407193005	MW11S-GW-101217	Water	10/12/17 11:50	10/14/17 09:15
10407193006	MW6U-GW-101217	Water	10/12/17 11:20	10/14/17 09:15
10407193007	MW6S-GW-101217	Water	10/12/17 10:55	10/14/17 09:15
10407193008	MW13S-GW-101217	Water	10/12/17 10:20	10/14/17 09:15
10407193009	MW12S-GW-101217	Water	10/12/17 09:35	10/14/17 09:15
10407193010	MW9U-GW-101217	Water	10/12/17 09:00	10/14/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10407193001	MW1S-GW-101217	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407193002	MW9S-GW-101217	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407193003	MW8S-GW-101217	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407193004	MW10S-GW-101217	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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### SAMPLE ANALYTE COUNT

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10407193005	MW11S-GW-101217	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
10407193006	MW6U-GW-101217	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
10407193007	MW6S-GW-101217	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
10407193008	MW13S-GW-101217	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M

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### SAMPLE ANALYTE COUNT

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407193009	MW12S-GW-101217	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407193010	MW9U-GW-101217	RSK 175	MJL	3	PASI-M
		6010C Met	IP	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10407193001</b>	<b>MW1S-GW-101217</b>					
6010C Met	Aluminum, Dissolved	721	ug/L	200	10/23/17 17:33	
6010C Met	Barium, Dissolved	232	ug/L	10.0	10/23/17 17:33	
6010C Met	Calcium, Dissolved	121000	ug/L	500	10/23/17 17:33	
6010C Met	Chromium, Dissolved	0.73J	ug/L	10.0	10/23/17 17:33	
6010C Met	Cobalt, Dissolved	5.2J	ug/L	10.0	10/23/17 17:33	
6010C Met	Copper, Dissolved	1.7J	ug/L	10.0	10/23/17 17:33	
6010C Met	Iron, Dissolved	1380	ug/L	50.0	10/23/17 17:33	
6010C Met	Magnesium, Dissolved	30600	ug/L	500	10/23/17 17:33	
6010C Met	Manganese, Dissolved	184	ug/L	5.0	10/23/17 17:33	
6010C Met	Nickel, Dissolved	1.9J	ug/L	20.0	10/23/17 17:33	
6010C Met	Potassium, Dissolved	1180J	ug/L	2500	10/23/17 17:33	
6010C Met	Sodium, Dissolved	37700	ug/L	1000	10/23/17 17:33	
6010C Met	Vanadium, Dissolved	7.7J	ug/L	15.0	10/23/17 17:33	
6010C Met	Zinc, Dissolved	36.1	ug/L	20.0	10/23/17 17:33	
SM 2320B	Alkalinity, Total as CaCO3	474	mg/L	5.0	10/23/17 10:16	
SM 2540C	Total Dissolved Solids	448	mg/L	20.0	10/19/17 14:57	
EPA 300.0	Chloride	7.0	mg/L	1.2	10/16/17 11:29	
EPA 300.0	Nitrate as N	0.056J	mg/L	0.10	10/16/17 11:29	H1
EPA 300.0	Sulfate	19.2	mg/L	1.2	10/16/17 11:29	
EPA 410.4	Chemical Oxygen Demand	17.4J	mg/L	50.0	10/16/17 15:20	
SM 5310C	Total Organic Carbon	3.6	mg/L	1.0	10/21/17 04:33	
<b>10407193002</b>	<b>MW9S-GW-101217</b>					
RSK 175	Methane	2.0J	ug/L	10.0	10/18/17 10:44	
6010C Met	Aluminum, Dissolved	978	ug/L	200	10/23/17 17:36	
6010C Met	Barium, Dissolved	75.0	ug/L	10.0	10/23/17 17:36	
6010C Met	Cadmium, Dissolved	0.94J	ug/L	3.0	10/23/17 17:36	
6010C Met	Calcium, Dissolved	68300	ug/L	500	10/23/17 17:36	
6010C Met	Chromium, Dissolved	0.51J	ug/L	10.0	10/23/17 17:36	
6010C Met	Cobalt, Dissolved	1.9J	ug/L	10.0	10/23/17 17:36	
6010C Met	Copper, Dissolved	1.1J	ug/L	10.0	10/23/17 17:36	
6010C Met	Iron, Dissolved	2030	ug/L	50.0	10/23/17 17:36	
6010C Met	Magnesium, Dissolved	15300	ug/L	500	10/23/17 17:36	
6010C Met	Manganese, Dissolved	61.0	ug/L	5.0	10/23/17 17:36	
6010C Met	Potassium, Dissolved	1800J	ug/L	2500	10/23/17 17:36	
6010C Met	Sodium, Dissolved	16000	ug/L	1000	10/23/17 17:36	
6010C Met	Vanadium, Dissolved	5.4J	ug/L	15.0	10/23/17 17:36	
6010C Met	Zinc, Dissolved	17.8J	ug/L	20.0	10/23/17 17:36	
SM 2320B	Alkalinity, Total as CaCO3	86.4	mg/L	5.0	10/23/17 10:22	
SM 2540C	Total Dissolved Solids	439	mg/L	10.0	10/19/17 14:57	
EPA 300.0	Chloride	28.6	mg/L	1.2	10/16/17 11:44	
EPA 300.0	Nitrate as N	14.0	mg/L	0.50	10/16/17 14:38	H1
EPA 300.0	Sulfate	77.4	mg/L	1.2	10/16/17 11:44	
EPA 353.2	Nitrogen, NO2 plus NO3	14.8	mg/L	0.20	10/19/17 13:09	
SM 5310C	Total Organic Carbon	1.7	mg/L	1.0	10/21/17 04:47	
<b>10407193003</b>	<b>MW8S-GW-101217</b>					
6010C Met	Aluminum, Dissolved	101J	ug/L	200	10/23/17 17:39	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10407193003</b>	<b>MW8S-GW-101217</b>					
6010C Met	Barium, Dissolved	42.2	ug/L	10.0	10/23/17 17:39	
6010C Met	Cadmium, Dissolved	0.84J	ug/L	3.0	10/23/17 17:39	
6010C Met	Calcium, Dissolved	48500	ug/L	500	10/23/17 17:39	
6010C Met	Cobalt, Dissolved	1.1J	ug/L	10.0	10/23/17 17:39	
6010C Met	Copper, Dissolved	0.85J	ug/L	10.0	10/23/17 17:39	
6010C Met	Iron, Dissolved	202	ug/L	50.0	10/23/17 17:39	
6010C Met	Magnesium, Dissolved	11700	ug/L	500	10/23/17 17:39	
6010C Met	Manganese, Dissolved	27.7	ug/L	5.0	10/23/17 17:39	
6010C Met	Potassium, Dissolved	760J	ug/L	2500	10/23/17 17:39	
6010C Met	Sodium, Dissolved	13600	ug/L	1000	10/23/17 17:39	
6010C Met	Vanadium, Dissolved	2.1J	ug/L	15.0	10/23/17 17:39	
6010C Met	Zinc, Dissolved	14.0J	ug/L	20.0	10/23/17 17:39	
SM 2320B	Alkalinity, Total as CaCO3	134	mg/L	5.0	10/23/17 10:25	
SM 2540C	Total Dissolved Solids	283	mg/L	10.0	10/19/17 14:57	
EPA 300.0	Chloride	1.8	mg/L	1.2	10/16/17 11:59	
EPA 300.0	Nitrate as N	7.8	mg/L	0.10	10/16/17 11:59	H1
EPA 300.0	Sulfate	19.6	mg/L	1.2	10/16/17 11:59	
EPA 353.2	Nitrogen, NO2 plus NO3	7.1	mg/L	0.20	10/28/17 17:19	
SM 5310C	Total Organic Carbon	1.3	mg/L	1.0	10/21/17 05:57	
<b>10407193004</b>	<b>MW10S-GW-101217</b>					
RSK 175	Methane	1.4J	ug/L	10.0	10/18/17 10:58	
6010C Met	Aluminum, Dissolved	82.0J	ug/L	200	10/23/17 17:42	
6010C Met	Barium, Dissolved	49.1	ug/L	10.0	10/23/17 17:42	
6010C Met	Calcium, Dissolved	82200	ug/L	500	10/23/17 17:42	
6010C Met	Cobalt, Dissolved	1.3J	ug/L	10.0	10/23/17 17:42	
6010C Met	Iron, Dissolved	122	ug/L	50.0	10/23/17 17:42	
6010C Met	Magnesium, Dissolved	22800	ug/L	500	10/23/17 17:42	
6010C Met	Manganese, Dissolved	3.4J	ug/L	5.0	10/23/17 17:42	
6010C Met	Potassium, Dissolved	881J	ug/L	2500	10/23/17 17:42	
6010C Met	Sodium, Dissolved	15000	ug/L	1000	10/23/17 17:42	
6010C Met	Vanadium, Dissolved	3.6J	ug/L	15.0	10/23/17 17:42	
6010C Met	Zinc, Dissolved	4.0J	ug/L	20.0	10/23/17 17:42	
SM 2320B	Alkalinity, Total as CaCO3	313	mg/L	5.0	10/23/17 10:50	
SM 2540C	Total Dissolved Solids	324	mg/L	10.0	10/19/17 16:23	
SM 4500-S-2 D	Sulfide, Total	0.0071J	mg/L	0.020	10/19/17 12:06	
EPA 300.0	Chloride	0.72J	mg/L	1.2	10/16/17 12:14	
EPA 300.0	Nitrate as N	0.16	mg/L	0.10	10/16/17 12:14	H1
EPA 300.0	Sulfate	2.1	mg/L	1.2	10/16/17 12:14	
EPA 353.2	Nitrogen, NO2 plus NO3	0.19	mg/L	0.020	10/19/17 12:36	
SM 5310C	Total Organic Carbon	0.44J	mg/L	1.0	10/21/17 06:11	
<b>10407193005</b>	<b>MW11S-GW-101217</b>					
RSK 175	Methane	1.2J	ug/L	10.0	10/18/17 11:05	
6010C Met	Aluminum, Dissolved	328	ug/L	200	10/23/17 17:45	
6010C Met	Barium, Dissolved	54.6	ug/L	10.0	10/23/17 17:45	
6010C Met	Calcium, Dissolved	51700	ug/L	500	10/23/17 17:45	
6010C Met	Cobalt, Dissolved	1.6J	ug/L	10.0	10/23/17 17:45	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10407193005</b>	<b>MW11S-GW-101217</b>					
6010C Met	Iron, Dissolved	358	ug/L	50.0	10/23/17 17:45	
6010C Met	Magnesium, Dissolved	14500	ug/L	500	10/23/17 17:45	
6010C Met	Manganese, Dissolved	122	ug/L	5.0	10/23/17 17:45	
6010C Met	Potassium, Dissolved	1520J	ug/L	2500	10/23/17 17:45	
6010C Met	Sodium, Dissolved	20100	ug/L	1000	10/23/17 17:45	
6010C Met	Vanadium, Dissolved	6.6J	ug/L	15.0	10/23/17 17:45	
6010C Met	Zinc, Dissolved	8.8J	ug/L	20.0	10/23/17 17:45	
SM 2320B	Alkalinity, Total as CaCO3	217	mg/L	5.0	10/23/17 10:54	
SM 2540C	Total Dissolved Solids	248	mg/L	10.0	10/19/17 16:23	
EPA 300.0	Chloride	1.0J	mg/L	1.2	10/16/17 12:30	
EPA 300.0	Nitrate as N	0.048J	mg/L	0.10	10/16/17 12:30	H1
EPA 300.0	Sulfate	2.7	mg/L	1.2	10/16/17 12:30	
EPA 353.2	Nitrogen, NO2 plus NO3	0.057	mg/L	0.020	10/19/17 12:37	FS
EPA 410.4	Chemical Oxygen Demand	33.9J	mg/L	50.0	10/16/17 15:21	
SM 5310C	Total Organic Carbon	1.1	mg/L	1.0	10/21/17 06:26	
<b>10407193006</b>	<b>MW6U-GW-101217</b>					
RSK 175	Methane	1.8J	ug/L	10.0	10/18/17 11:13	
6010C Met	Aluminum, Dissolved	38.8J	ug/L	200	10/23/17 17:47	
6010C Met	Barium, Dissolved	62.8	ug/L	10.0	10/23/17 17:47	
6010C Met	Cadmium, Dissolved	0.54J	ug/L	3.0	10/23/17 17:47	
6010C Met	Calcium, Dissolved	66200	ug/L	500	10/23/17 17:47	
6010C Met	Copper, Dissolved	0.87J	ug/L	10.0	10/23/17 17:47	
6010C Met	Iron, Dissolved	57.7	ug/L	50.0	10/23/17 17:47	
6010C Met	Lead, Dissolved	3.4J	ug/L	10.0	10/23/17 17:47	
6010C Met	Magnesium, Dissolved	20000	ug/L	500	10/23/17 17:47	
6010C Met	Manganese, Dissolved	4.7J	ug/L	5.0	10/23/17 17:47	
6010C Met	Potassium, Dissolved	2050J	ug/L	2500	10/23/17 17:47	
6010C Met	Sodium, Dissolved	15800	ug/L	1000	10/23/17 17:47	
6010C Met	Thallium, Dissolved	4.9J	ug/L	20.0	10/24/17 11:35	
6010C Met	Vanadium, Dissolved	6.0J	ug/L	15.0	10/23/17 17:47	
6010C Met	Zinc, Dissolved	16.0J	ug/L	20.0	10/23/17 17:47	
EPA 7470A	Mercury, Dissolved	0.55	ug/L	0.20	10/17/17 15:50	
SM 2320B	Alkalinity, Total as CaCO3	264	mg/L	5.0	10/23/17 10:59	
SM 2540C	Total Dissolved Solids	240	mg/L	200	10/19/17 16:23	
EPA 300.0	Chloride	4.4	mg/L	1.2	10/16/17 15:32	
EPA 300.0	Nitrate as N	1.8	mg/L	0.10	10/16/17 15:32	H1
EPA 300.0	Sulfate	8.1	mg/L	1.2	10/16/17 15:32	
EPA 353.2	Nitrogen, NO2 plus NO3	1.8	mg/L	0.020	10/19/17 12:38	
SM 5310C	Total Organic Carbon	1.3	mg/L	1.0	10/21/17 06:40	
<b>10407193007</b>	<b>MW6S-GW-101217</b>					
RSK 175	Methane	1.2J	ug/L	10.0	10/18/17 11:20	
6010C Met	Aluminum, Dissolved	1970	ug/L	200	10/23/17 17:50	
6010C Met	Barium, Dissolved	54.8	ug/L	10.0	10/23/17 17:50	
6010C Met	Calcium, Dissolved	36000	ug/L	500	10/23/17 17:50	
6010C Met	Chromium, Dissolved	0.74J	ug/L	10.0	10/23/17 17:50	
6010C Met	Cobalt, Dissolved	1.4J	ug/L	10.0	10/23/17 17:50	

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### SUMMARY OF DETECTION

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10407193007</b>	<b>MW6S-GW-101217</b>					
6010C Met	Copper, Dissolved	1.2J	ug/L	10.0	10/23/17 17:50	
6010C Met	Iron, Dissolved	2490	ug/L	50.0	10/23/17 17:50	
6010C Met	Magnesium, Dissolved	9920	ug/L	500	10/23/17 17:50	
6010C Met	Manganese, Dissolved	16.3	ug/L	5.0	10/23/17 17:50	
6010C Met	Potassium, Dissolved	938J	ug/L	2500	10/23/17 17:50	
6010C Met	Sodium, Dissolved	11300	ug/L	1000	10/23/17 17:50	
6010C Met	Vanadium, Dissolved	12.4J	ug/L	15.0	10/23/17 17:50	
6010C Met	Zinc, Dissolved	10.3J	ug/L	20.0	10/23/17 17:50	
SM 2320B	Alkalinity, Total as CaCO3	160	mg/L	5.0	10/23/17 11:05	
SM 2540C	Total Dissolved Solids	218	mg/L	10.0	10/19/17 16:23	
EPA 300.0	Chloride	1.6	mg/L	1.2	10/16/17 12:45	
EPA 300.0	Nitrate as N	0.086J	mg/L	0.10	10/16/17 12:45	H1
EPA 300.0	Sulfate	2.1	mg/L	1.2	10/16/17 12:45	
EPA 353.2	Nitrogen, NO2 plus NO3	0.073	mg/L	0.020	10/19/17 12:39	FS
EPA 410.4	Chemical Oxygen Demand	30.1J	mg/L	50.0	10/16/17 15:22	
SM 5310C	Total Organic Carbon	1.9	mg/L	1.0	10/21/17 06:54	
<b>10407193008</b>	<b>MW13S-GW-101217</b>					
RSK 175	Methane	1.3J	ug/L	10.0	10/18/17 11:27	
6010C Met	Barium, Dissolved	68.1	ug/L	10.0	10/23/17 17:53	
6010C Met	Calcium, Dissolved	39900	ug/L	500	10/23/17 17:53	
6010C Met	Copper, Dissolved	0.83J	ug/L	10.0	10/23/17 17:53	
6010C Met	Magnesium, Dissolved	11600	ug/L	500	10/23/17 17:53	
6010C Met	Manganese, Dissolved	1.1J	ug/L	5.0	10/23/17 17:53	
6010C Met	Potassium, Dissolved	1620J	ug/L	2500	10/23/17 17:53	
6010C Met	Sodium, Dissolved	14900	ug/L	1000	10/23/17 17:53	
6010C Met	Vanadium, Dissolved	9.7J	ug/L	15.0	10/23/17 17:53	
6010C Met	Zinc, Dissolved	2.5J	ug/L	20.0	10/23/17 17:53	
SM 2320B	Alkalinity, Total as CaCO3	168	mg/L	5.0	10/23/17 11:09	
SM 2540C	Total Dissolved Solids	498	mg/L	20.0	10/19/17 16:23	
EPA 300.0	Chloride	1.2J	mg/L	1.2	10/16/17 13:00	
EPA 300.0	Nitrate as N	0.18	mg/L	0.10	10/16/17 13:00	H1
EPA 300.0	Sulfate	4.1	mg/L	1.2	10/16/17 13:00	
EPA 353.2	Nitrogen, NO2 plus NO3	0.22	mg/L	0.020	10/19/17 12:42	
SM 5310C	Total Organic Carbon	0.42J	mg/L	1.0	10/24/17 17:05	
<b>10407193009</b>	<b>MW12S-GW-101217</b>					
RSK 175	Methane	2.9J	ug/L	10.0	10/18/17 12:46	
6010C Met	Aluminum, Dissolved	10400	ug/L	200	10/23/17 17:56	
6010C Met	Barium, Dissolved	219	ug/L	10.0	10/23/17 17:56	
6010C Met	Calcium, Dissolved	81300	ug/L	500	10/23/17 17:56	
6010C Met	Chromium, Dissolved	5.3J	ug/L	10.0	10/23/17 17:56	
6010C Met	Cobalt, Dissolved	7.9J	ug/L	10.0	10/23/17 17:56	
6010C Met	Copper, Dissolved	4.0J	ug/L	10.0	10/23/17 17:56	
6010C Met	Iron, Dissolved	4690	ug/L	50.0	10/23/17 17:56	
6010C Met	Lead, Dissolved	7.4J	ug/L	10.0	10/23/17 17:56	
6010C Met	Magnesium, Dissolved	23500	ug/L	500	10/23/17 17:56	
6010C Met	Manganese, Dissolved	522	ug/L	5.0	10/23/17 17:56	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10407193009</b>	<b>MW12S-GW-101217</b>					
6010C Met	Nickel, Dissolved	7.4J	ug/L	20.0	10/23/17 17:56	
6010C Met	Potassium, Dissolved	1160J	ug/L	2500	10/23/17 17:56	
6010C Met	Sodium, Dissolved	36900	ug/L	1000	10/23/17 17:56	
6010C Met	Vanadium, Dissolved	18.2	ug/L	15.0	10/23/17 17:56	
6010C Met	Zinc, Dissolved	8.6J	ug/L	20.0	10/23/17 17:56	
SM 2320B	Alkalinity, Total as CaCO3	266	mg/L	5.0	10/23/17 11:13	
SM 2540C	Total Dissolved Solids	234	mg/L	10.0	10/19/17 16:23	
SM 4500-S-2 D	Sulfide, Total	0.052	mg/L	0.040	10/19/17 12:01	
EPA 300.0	Chloride	40.4	mg/L	1.2	10/16/17 13:15	
EPA 300.0	Nitrate as N	4.7	mg/L	0.10	10/16/17 13:15	H1
EPA 300.0	Sulfate	37.5	mg/L	1.2	10/16/17 13:15	
EPA 353.2	Nitrogen, NO2 plus NO3	4.9	mg/L	0.10	10/19/17 13:10	FS
EPA 410.4	Chemical Oxygen Demand	27.2J	mg/L	50.0	10/16/17 15:22	
SM 5310C	Total Organic Carbon	3.4	mg/L	1.0	10/24/17 17:44	
<b>10407193010</b>	<b>MW9U-GW-101217</b>					
RSK 175	Methane	1.2J	ug/L	10.0	10/18/17 12:53	
6010C Met	Aluminum, Dissolved	15.4J	ug/L	200	10/23/17 18:13	
6010C Met	Barium, Dissolved	20.4	ug/L	10.0	10/23/17 18:13	
6010C Met	Calcium, Dissolved	53700	ug/L	500	10/23/17 18:13	
6010C Met	Magnesium, Dissolved	14400	ug/L	500	10/23/17 18:13	
6010C Met	Manganese, Dissolved	3.1J	ug/L	5.0	10/23/17 18:13	
6010C Met	Potassium, Dissolved	2200J	ug/L	2500	10/23/17 18:13	
6010C Met	Sodium, Dissolved	14000	ug/L	1000	10/23/17 18:13	
6010C Met	Vanadium, Dissolved	6.4J	ug/L	15.0	10/23/17 18:13	
SM 2320B	Alkalinity, Total as CaCO3	152	mg/L	5.0	10/23/17 11:30	
SM 2540C	Total Dissolved Solids	292	mg/L	10.0	10/19/17 16:23	
EPA 300.0	Chloride	9.6	mg/L	1.2	10/16/17 14:20	
EPA 300.0	Nitrate as N	5.4	mg/L	0.10	10/16/17 14:20	H3
EPA 300.0	Sulfate	29.6	mg/L	1.2	10/16/17 14:20	
EPA 353.2	Nitrogen, NO2 plus NO3	6.2	mg/L	0.10	10/19/17 13:12	
SM 5310C	Total Organic Carbon	0.78J	mg/L	1.0	10/24/17 17:58	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502619

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92358871006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2732198)
- Mercury, Dissolved

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

### General Information:

10 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 92264

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10407193001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 396657)
- Sulfide, Total

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

### General Information:

10 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW10S-GW-101217 (Lab ID: 10407193004)
- MW11S-GW-101217 (Lab ID: 10407193005)
- MW12S-GW-101217 (Lab ID: 10407193009)
- MW13S-GW-101217 (Lab ID: 10407193008)
- MW1S-GW-101217 (Lab ID: 10407193001)
- MW6S-GW-101217 (Lab ID: 10407193007)
- MW6U-GW-101217 (Lab ID: 10407193006)
- MW8S-GW-101217 (Lab ID: 10407193003)
- MW9S-GW-101217 (Lab ID: 10407193002)

H3: Sample was received or analysis requested beyond the recognized method holding time.

- MW9U-GW-101217 (Lab ID: 10407193010)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 502680

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 7575437001,7575442001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2732425)
  - Sulfate
- MS (Lab ID: 2732427)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2732426)
  - Sulfate
- MSD (Lab ID: 2732428)
  - Chloride
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

10 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Project No.: 10407193

**Sample:** MW1S-GW-101217      **Lab ID:** 10407193001      Collected: 10/12/17 14:10      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 10:36	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 10:36	74-85-1	
Methane	<1.1	ug/L	10.0	1.1	1		10/18/17 10:36	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	721	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:33	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:33	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:33	7440-38-2	
Barium, Dissolved	232	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:33	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:33	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:33	7440-43-9	
Calcium, Dissolved	121000	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:33	7440-70-2	
Chromium, Dissolved	0.73J	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:33	7440-47-3	
Cobalt, Dissolved	5.2J	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:33	7440-48-4	
Copper, Dissolved	1.7J	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:33	7440-50-8	
Iron, Dissolved	1380	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:33	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:33	7439-92-1	
Magnesium, Dissolved	30600	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:33	7439-95-4	
Manganese, Dissolved	184	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:33	7439-96-5	
Nickel, Dissolved	1.9J	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:33	7440-02-0	
Potassium, Dissolved	1180J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:33	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:33	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:33	7440-22-4	
Sodium, Dissolved	37700	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:33	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:21	7440-28-0	
Vanadium, Dissolved	7.7J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:33	7440-62-2	
Zinc, Dissolved	36.1	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:33	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:38	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	474	mg/L	5.0	1.4	1		10/23/17 10:16		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	448	mg/L	20.0	10.0	1		10/19/17 14:57		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:03	18496-25-8	M1
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.0	mg/L	1.2	0.14	1		10/16/17 11:29	16887-00-6	
Nitrate as N	0.056J	mg/L	0.10	0.0079	1		10/16/17 11:29	14797-55-8	H1
Sulfate	19.2	mg/L	1.2	0.27	1		10/16/17 11:29	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW1S-GW-101217**      **Lab ID: 10407193001**      Collected: 10/12/17 14:10      Received: 10/14/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		10/19/17 12:32		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>17.4J</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:20		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.6</b>	mg/L	1.0	0.20	1		10/21/17 04:33	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Sample: **MW9S-GW-101217** Lab ID: **10407193002** Collected: 10/12/17 13:40 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 10:44	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 10:44	74-85-1	
Methane	2.0J	ug/L	10.0	1.1	1		10/18/17 10:44	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	978	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:36	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:36	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:36	7440-38-2	
Barium, Dissolved	75.0	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:36	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:36	7440-41-7	
Cadmium, Dissolved	0.94J	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:36	7440-43-9	
Calcium, Dissolved	68300	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:36	7440-70-2	
Chromium, Dissolved	0.51J	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:36	7440-47-3	
Cobalt, Dissolved	1.9J	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:36	7440-48-4	
Copper, Dissolved	1.1J	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:36	7440-50-8	
Iron, Dissolved	2030	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:36	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:36	7439-92-1	
Magnesium, Dissolved	15300	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:36	7439-95-4	
Manganese, Dissolved	61.0	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:36	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:36	7440-02-0	
Potassium, Dissolved	1800J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:36	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:36	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:36	7440-22-4	
Sodium, Dissolved	16000	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:36	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:24	7440-28-0	
Vanadium, Dissolved	5.4J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:36	7440-62-2	
Zinc, Dissolved	17.8J	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:36	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:40	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	86.4	mg/L	5.0	1.4	1		10/23/17 10:22		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	439	mg/L	10.0	5.0	1		10/19/17 14:57		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:05	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	28.6	mg/L	1.2	0.14	1		10/16/17 11:44	16887-00-6	
Nitrate as N	14.0	mg/L	0.50	0.040	5		10/16/17 14:38	14797-55-8	H1
Sulfate	77.4	mg/L	1.2	0.27	1		10/16/17 11:44	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW9S-GW-101217**      **Lab ID: 10407193002**      Collected: 10/12/17 13:40      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>14.8</b>	mg/L	0.20	0.075	10		10/19/17 13:09		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:20		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.7</b>	mg/L	1.0	0.20	1		10/21/17 04:47	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

**Sample: MW8S-GW-101217**      **Lab ID: 10407193003**      Collected: 10/12/17 13:20      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 10:51	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 10:51	74-85-1	
Methane	<1.1	ug/L	10.0	1.1	1		10/18/17 10:51	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<b>101J</b>	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:39	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:39	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:39	7440-38-2	
Barium, Dissolved	<b>42.2</b>	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:39	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:39	7440-41-7	
Cadmium, Dissolved	<b>0.84J</b>	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:39	7440-43-9	
Calcium, Dissolved	<b>48500</b>	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:39	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:39	7440-47-3	
Cobalt, Dissolved	<b>1.1J</b>	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:39	7440-48-4	
Copper, Dissolved	<b>0.85J</b>	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:39	7440-50-8	
Iron, Dissolved	<b>202</b>	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:39	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:39	7439-92-1	
Magnesium, Dissolved	<b>11700</b>	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:39	7439-95-4	
Manganese, Dissolved	<b>27.7</b>	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:39	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:39	7440-02-0	
Potassium, Dissolved	<b>760J</b>	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:39	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:39	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:39	7440-22-4	
Sodium, Dissolved	<b>13600</b>	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:39	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:27	7440-28-0	
Vanadium, Dissolved	<b>2.1J</b>	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:39	7440-62-2	
Zinc, Dissolved	<b>14.0J</b>	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:39	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:43	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	<b>134</b>	mg/L	5.0	1.4	1		10/23/17 10:25		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	<b>283</b>	mg/L	10.0	5.0	1		10/19/17 14:57		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:05	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	<b>1.8</b>	mg/L	1.2	0.14	1		10/16/17 11:59	16887-00-6	
Nitrate as N	<b>7.8</b>	mg/L	0.10	0.0079	1		10/16/17 11:59	14797-55-8	H1
Sulfate	<b>19.6</b>	mg/L	1.2	0.27	1		10/16/17 11:59	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW8S-GW-101217**      **Lab ID: 10407193003**      Collected: 10/12/17 13:20      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>7.1</b>	mg/L	0.20	0.075	10		10/28/17 17:19		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:21		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.3</b>	mg/L	1.0	0.20	1		10/21/17 05:57	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Sample: **MW10S-GW-101217** Lab ID: **10407193004** Collected: 10/12/17 12:15 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<b>&lt;4.9</b>	ug/L	10.0	4.9	1		10/18/17 10:58	74-84-0	
Ethene	<b>&lt;0.68</b>	ug/L	10.0	0.68	1		10/18/17 10:58	74-85-1	
Methane	<b>1.4J</b>	ug/L	10.0	1.1	1		10/18/17 10:58	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	<b>82.0J</b>	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:42	7429-90-5	
Antimony, Dissolved	<b>&lt;3.1</b>	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:42	7440-36-0	
Arsenic, Dissolved	<b>&lt;5.2</b>	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:42	7440-38-2	
Barium, Dissolved	<b>49.1</b>	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:42	7440-39-3	
Beryllium, Dissolved	<b>&lt;0.11</b>	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:42	7440-41-7	
Cadmium, Dissolved	<b>&lt;0.46</b>	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:42	7440-43-9	
Calcium, Dissolved	<b>82200</b>	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:42	7440-70-2	
Chromium, Dissolved	<b>&lt;0.50</b>	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:42	7440-47-3	
Cobalt, Dissolved	<b>1.3J</b>	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:42	7440-48-4	
Copper, Dissolved	<b>&lt;0.83</b>	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:42	7440-50-8	
Iron, Dissolved	<b>122</b>	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:42	7439-89-6	
Lead, Dissolved	<b>&lt;3.0</b>	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:42	7439-92-1	
Magnesium, Dissolved	<b>22800</b>	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:42	7439-95-4	
Manganese, Dissolved	<b>3.4J</b>	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:42	7439-96-5	
Nickel, Dissolved	<b>&lt;1.1</b>	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:42	7440-02-0	
Potassium, Dissolved	<b>881J</b>	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:42	7440-09-7	
Selenium, Dissolved	<b>&lt;6.4</b>	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:42	7782-49-2	
Silver, Dissolved	<b>&lt;0.27</b>	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:42	7440-22-4	
Sodium, Dissolved	<b>15000</b>	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:42	7440-23-5	
Thallium, Dissolved	<b>&lt;4.8</b>	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:29	7440-28-0	
Vanadium, Dissolved	<b>3.6J</b>	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:42	7440-62-2	
Zinc, Dissolved	<b>4.0J</b>	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:42	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<b>&lt;0.062</b>	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:45	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<b>313</b>	mg/L	5.0	1.4	1		10/23/17 10:50		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>324</b>	mg/L	10.0	5.0	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<b>0.0071J</b>	mg/L	0.020	0.0050	1		10/19/17 12:06	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	<b>0.72J</b>	mg/L	1.2	0.14	1		10/16/17 12:14	16887-00-6	
Nitrate as N	<b>0.16</b>	mg/L	0.10	0.0079	1		10/16/17 12:14	14797-55-8	H1
Sulfate	<b>2.1</b>	mg/L	1.2	0.27	1		10/16/17 12:14	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW10S-GW-101217**      **Lab ID: 10407193004**      Collected: 10/12/17 12:15      Received: 10/14/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.19</b>	mg/L	0.020	0.0075	1		10/19/17 12:36		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:21		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.44J</b>	mg/L	1.0	0.20	1		10/21/17 06:11	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Sample: MW11S-GW-101217 Lab ID: 10407193005 Collected: 10/12/17 11:50 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 11:05	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 11:05	74-85-1	
Methane	1.2J	ug/L	10.0	1.1	1		10/18/17 11:05	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	328	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:45	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:45	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:45	7440-38-2	
Barium, Dissolved	54.6	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:45	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:45	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:45	7440-43-9	
Calcium, Dissolved	51700	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:45	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:45	7440-47-3	
Cobalt, Dissolved	1.6J	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:45	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:45	7440-50-8	
Iron, Dissolved	358	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:45	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:45	7439-92-1	
Magnesium, Dissolved	14500	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:45	7439-95-4	
Manganese, Dissolved	122	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:45	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:45	7440-02-0	
Potassium, Dissolved	1520J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:45	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:45	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:45	7440-22-4	
Sodium, Dissolved	20100	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:45	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:32	7440-28-0	
Vanadium, Dissolved	6.6J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:45	7440-62-2	
Zinc, Dissolved	8.8J	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:45	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:47	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	217	mg/L	5.0	1.4	1		10/23/17 10:54		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	248	mg/L	10.0	5.0	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:06	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.0J	mg/L	1.2	0.14	1		10/16/17 12:30	16887-00-6	
Nitrate as N	0.048J	mg/L	0.10	0.0079	1		10/16/17 12:30	14797-55-8	H1
Sulfate	2.7	mg/L	1.2	0.27	1		10/16/17 12:30	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample:** MW11S-GW-101217      **Lab ID:** 10407193005      Collected: 10/12/17 11:50      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.057</b>	mg/L	0.020	0.0075	1		10/19/17 12:37		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>33.9J</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:21		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.1</b>	mg/L	1.0	0.20	1		10/21/17 06:26	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Sample: **MW6U-GW-101217** Lab ID: **10407193006** Collected: 10/12/17 11:20 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 11:13	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 11:13	74-85-1	
Methane	1.8J	ug/L	10.0	1.1	1		10/18/17 11:13	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	38.8J	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:47	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:47	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:47	7440-38-2	
Barium, Dissolved	62.8	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:47	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:47	7440-41-7	
Cadmium, Dissolved	0.54J	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:47	7440-43-9	
Calcium, Dissolved	66200	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:47	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:47	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:47	7440-48-4	
Copper, Dissolved	0.87J	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:47	7440-50-8	
Iron, Dissolved	57.7	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:47	7439-89-6	
Lead, Dissolved	3.4J	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:47	7439-92-1	
Magnesium, Dissolved	20000	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:47	7439-95-4	
Manganese, Dissolved	4.7J	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:47	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:47	7440-02-0	
Potassium, Dissolved	2050J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:47	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:47	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:47	7440-22-4	
Sodium, Dissolved	15800	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:47	7440-23-5	
Thallium, Dissolved	4.9J	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:35	7440-28-0	
Vanadium, Dissolved	6.0J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:47	7440-62-2	
Zinc, Dissolved	16.0J	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:47	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	0.55	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:50	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	264	mg/L	5.0	1.4	1		10/23/17 10:59		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	240	mg/L	200	100	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:07	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	4.4	mg/L	1.2	0.14	1		10/16/17 15:32	16887-00-6	
Nitrate as N	1.8	mg/L	0.10	0.0079	1		10/16/17 15:32	14797-55-8	H1
Sulfate	8.1	mg/L	1.2	0.27	1		10/16/17 15:32	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW6U-GW-101217**      **Lab ID: 10407193006**      Collected: 10/12/17 11:20      Received: 10/14/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.8</b>	mg/L	0.020	0.0075	1		10/19/17 12:38		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:21		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.3</b>	mg/L	1.0	0.20	1		10/21/17 06:40	7440-44-0	

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### ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

**Sample: MW6S-GW-101217**      **Lab ID: 10407193007**      Collected: 10/12/17 10:55      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 11:20	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 11:20	74-85-1	
Methane	1.2J	ug/L	10.0	1.1	1		10/18/17 11:20	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	1970	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:50	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:50	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:50	7440-38-2	
Barium, Dissolved	54.8	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:50	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:50	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:50	7440-43-9	
Calcium, Dissolved	36000	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:50	7440-70-2	
Chromium, Dissolved	0.74J	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:50	7440-47-3	
Cobalt, Dissolved	1.4J	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:50	7440-48-4	
Copper, Dissolved	1.2J	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:50	7440-50-8	
Iron, Dissolved	2490	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:50	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:50	7439-92-1	
Magnesium, Dissolved	9920	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:50	7439-95-4	
Manganese, Dissolved	16.3	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:50	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:50	7440-02-0	
Potassium, Dissolved	938J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:50	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:50	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:50	7440-22-4	
Sodium, Dissolved	11300	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:50	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:38	7440-28-0	
Vanadium, Dissolved	12.4J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:50	7440-62-2	
Zinc, Dissolved	10.3J	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:50	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:56	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	160	mg/L	5.0	1.4	1		10/23/17 11:05		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	218	mg/L	10.0	5.0	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:08	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.6	mg/L	1.2	0.14	1		10/16/17 12:45	16887-00-6	
Nitrate as N	0.086J	mg/L	0.10	0.0079	1		10/16/17 12:45	14797-55-8	H1
Sulfate	2.1	mg/L	1.2	0.27	1		10/16/17 12:45	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW6S-GW-101217**      **Lab ID: 10407193007**      Collected: 10/12/17 10:55      Received: 10/14/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.073</b>	mg/L	0.020	0.0075	1		10/19/17 12:39		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>30.1J</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:22		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.9</b>	mg/L	1.0	0.20	1		10/21/17 06:54	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Sample: **MW13S-GW-101217** Lab ID: **10407193008** Collected: 10/12/17 10:20 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 11:27	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 11:27	74-85-1	
Methane	1.3J	ug/L	10.0	1.1	1		10/18/17 11:27	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met Preparation Method: EPA 3010							
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:53	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:53	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:53	7440-38-2	
Barium, Dissolved	68.1	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:53	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:53	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:53	7440-43-9	
Calcium, Dissolved	39900	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:53	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:53	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:53	7440-48-4	
Copper, Dissolved	0.83J	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:53	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:53	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:53	7439-92-1	
Magnesium, Dissolved	11600	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:53	7439-95-4	
Manganese, Dissolved	1.1J	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:53	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:53	7440-02-0	
Potassium, Dissolved	1620J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:53	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:53	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:53	7440-22-4	
Sodium, Dissolved	14900	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:53	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:41	7440-28-0	
Vanadium, Dissolved	9.7J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:53	7440-62-2	
Zinc, Dissolved	2.5J	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:53	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 15:59	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	168	mg/L	5.0	1.4	1		10/23/17 11:09		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	498	mg/L	20.0	10.0	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:08	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	1.2J	mg/L	1.2	0.14	1		10/16/17 13:00	16887-00-6	
Nitrate as N	0.18	mg/L	0.10	0.0079	1		10/16/17 13:00	14797-55-8	H1
Sulfate	4.1	mg/L	1.2	0.27	1		10/16/17 13:00	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW13S-GW-101217**      **Lab ID: 10407193008**      Collected: 10/12/17 10:20      Received: 10/14/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.22</b>	mg/L	0.020	0.0075	1		10/19/17 12:42		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:22		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.42J</b>	mg/L	1.0	0.20	1		10/24/17 17:05	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Sample: **MW12S-GW-101217** Lab ID: **10407193009** Collected: 10/12/17 09:35 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 12:46	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 12:46	74-85-1	
Methane	2.9J	ug/L	10.0	1.1	1		10/18/17 12:46	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	10400	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 17:56	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 17:56	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 17:56	7440-38-2	
Barium, Dissolved	219	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 17:56	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 17:56	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 17:56	7440-43-9	
Calcium, Dissolved	81300	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 17:56	7440-70-2	
Chromium, Dissolved	5.3J	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 17:56	7440-47-3	
Cobalt, Dissolved	7.9J	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 17:56	7440-48-4	
Copper, Dissolved	4.0J	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 17:56	7440-50-8	
Iron, Dissolved	4690	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 17:56	7439-89-6	
Lead, Dissolved	7.4J	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 17:56	7439-92-1	
Magnesium, Dissolved	23500	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 17:56	7439-95-4	
Manganese, Dissolved	522	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 17:56	7439-96-5	
Nickel, Dissolved	7.4J	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 17:56	7440-02-0	
Potassium, Dissolved	1160J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 17:56	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 17:56	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 17:56	7440-22-4	
Sodium, Dissolved	36900	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 17:56	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:54	7440-28-0	
Vanadium, Dissolved	18.2	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 17:56	7440-62-2	
Zinc, Dissolved	8.6J	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 17:56	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 16:01	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	266	mg/L	5.0	1.4	1		10/23/17 11:13		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	234	mg/L	10.0	5.0	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.052	mg/L	0.040	0.010	2		10/19/17 12:01	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	40.4	mg/L	1.2	0.14	1		10/16/17 13:15	16887-00-6	
Nitrate as N	4.7	mg/L	0.10	0.0079	1		10/16/17 13:15	14797-55-8	H1
Sulfate	37.5	mg/L	1.2	0.27	1		10/16/17 13:15	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW12S-GW-101217**      **Lab ID: 10407193009**      Collected: 10/12/17 09:35      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.9</b>	mg/L	0.10	0.037	5		10/19/17 13:10		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>27.2J</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:22		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.4</b>	mg/L	1.0	0.20	1		10/24/17 17:44	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

**Sample:** MW9U-GW-101217      **Lab ID:** 10407193010      Collected: 10/12/17 09:00      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/18/17 12:53	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/18/17 12:53	74-85-1	
Methane	1.2J	ug/L	10.0	1.1	1		10/18/17 12:53	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	15.4J	ug/L	200	8.6	1	10/16/17 15:18	10/23/17 18:13	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/16/17 15:18	10/23/17 18:13	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/16/17 15:18	10/23/17 18:13	7440-38-2	
Barium, Dissolved	20.4	ug/L	10.0	0.22	1	10/16/17 15:18	10/23/17 18:13	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/16/17 15:18	10/23/17 18:13	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/16/17 15:18	10/23/17 18:13	7440-43-9	
Calcium, Dissolved	53700	ug/L	500	24.7	1	10/16/17 15:18	10/23/17 18:13	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/16/17 15:18	10/23/17 18:13	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/16/17 15:18	10/23/17 18:13	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/16/17 15:18	10/23/17 18:13	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/16/17 15:18	10/23/17 18:13	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/16/17 15:18	10/23/17 18:13	7439-92-1	
Magnesium, Dissolved	14400	ug/L	500	2.6	1	10/16/17 15:18	10/23/17 18:13	7439-95-4	
Manganese, Dissolved	3.1J	ug/L	5.0	0.38	1	10/16/17 15:18	10/23/17 18:13	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/16/17 15:18	10/23/17 18:13	7440-02-0	
Potassium, Dissolved	2200J	ug/L	2500	126	1	10/16/17 15:18	10/23/17 18:13	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/16/17 15:18	10/23/17 18:13	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/16/17 15:18	10/23/17 18:13	7440-22-4	
Sodium, Dissolved	14000	ug/L	1000	44.6	1	10/16/17 15:18	10/23/17 18:13	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	10/16/17 15:18	10/24/17 11:56	7440-28-0	
Vanadium, Dissolved	6.4J	ug/L	15.0	0.42	1	10/16/17 15:18	10/23/17 18:13	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	10/16/17 15:18	10/23/17 18:13	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/16/17 13:41	10/17/17 16:03	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	152	mg/L	5.0	1.4	1		10/23/17 11:30		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	292	mg/L	10.0	5.0	1		10/19/17 16:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/19/17 12:09	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	9.6	mg/L	1.2	0.14	1		10/16/17 14:20	16887-00-6	
Nitrate as N	5.4	mg/L	0.10	0.0079	1		10/16/17 14:20	14797-55-8	H3
Sulfate	29.6	mg/L	1.2	0.27	1		10/16/17 14:20	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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**Sample: MW9U-GW-101217**      **Lab ID: 10407193010**      Collected: 10/12/17 09:00      Received: 10/14/17 09:15      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>6.2</b>	mg/L	0.10	0.037	5		10/19/17 13:12		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/16/17 10:39	10/16/17 15:23		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.78J</b>	mg/L	1.0	0.20	1		10/24/17 17:58	7440-44-0	

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**QUALITY CONTROL DATA**

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch:	502939	Analysis Method:	RSK 175
QC Batch Method:	RSK 175	Analysis Description:	RSK 175 AIR HEADSPACE
Associated Lab Samples:	10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010		

METHOD BLANK:	2733642	Matrix:	Water
Associated Lab Samples:	10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/18/17 10:15	
Ethene	ug/L	<0.68	10.0	0.68	10/18/17 10:15	
Methane	ug/L	1.6J	10.0	1.1	10/18/17 10:15	

Parameter	Units	2733643		2733644		% Rec Limits	RPD	Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCS Result	LCSD % Rec				
Ethane	ug/L	114	104	98.8	92	85-115	6	20	
Ethene	ug/L	106	98.0	94.0	92	85-115	4	20	
Methane	ug/L	60.7	56.1	54.9	92	85-115	2	20	

Parameter	Units	60255383007		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	165	5.8J		20	

Parameter	Units	60255478005		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	2.6J	1.7J		20	

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**QUALITY CONTROL DATA**

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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QC Batch: 502619 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

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METHOD BLANK: 2732196 Matrix: Water  
 Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	10/17/17 15:07	

LABORATORY CONTROL SAMPLE: 2732197

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.6	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732198 2732199

Parameter	Units	92358871006 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury, Dissolved	ug/L	ND	5	5	3.9	4.6	77	92	80-120	17	20	M1		

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch: 502617 Analysis Method: 6010C Met  
 QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
 Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

METHOD BLANK: 2732188 Matrix: Water  
 Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	10/24/17 11:15	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	10/24/17 11:15	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	10/24/17 11:15	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	10/24/17 11:15	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	10/24/17 11:15	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	10/24/17 11:15	
Calcium, Dissolved	ug/L	<24.7	500	24.7	10/24/17 11:15	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	10/24/17 11:15	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	10/24/17 11:15	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	10/24/17 11:15	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	10/24/17 11:15	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	10/24/17 11:15	
Magnesium, Dissolved	ug/L	4.7J	500	2.6	10/24/17 11:15	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	10/24/17 11:15	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	10/24/17 11:15	
Potassium, Dissolved	ug/L	<126	2500	126	10/24/17 11:15	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	10/24/17 11:15	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	10/24/17 11:15	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	10/24/17 11:15	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	10/24/17 11:15	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	10/24/17 11:15	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	10/24/17 11:15	

LABORATORY CONTROL SAMPLE: 2732189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20900	105	80-120	
Antimony, Dissolved	ug/L	1000	1050	105	80-120	
Arsenic, Dissolved	ug/L	1000	1030	103	80-120	
Barium, Dissolved	ug/L	1000	1050	105	80-120	
Beryllium, Dissolved	ug/L	1000	1030	103	80-120	
Cadmium, Dissolved	ug/L	1000	1030	103	80-120	
Calcium, Dissolved	ug/L	20000	20900	104	80-120	
Chromium, Dissolved	ug/L	1000	1030	103	80-120	
Cobalt, Dissolved	ug/L	1000	1030	103	80-120	
Copper, Dissolved	ug/L	1000	1020	102	80-120	
Iron, Dissolved	ug/L	20000	20400	102	80-120	
Lead, Dissolved	ug/L	1000	1050	105	80-120	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

LABORATORY CONTROL SAMPLE: 2732189

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Magnesium, Dissolved	ug/L	20000	21000	105	80-120	
Manganese, Dissolved	ug/L	1000	1040	104	80-120	
Nickel, Dissolved	ug/L	1000	1040	104	80-120	
Potassium, Dissolved	ug/L	20000	21300	107	80-120	
Selenium, Dissolved	ug/L	1000	1090	109	80-120	
Silver, Dissolved	ug/L	500	517	103	80-120	
Sodium, Dissolved	ug/L	20000	20700	104	80-120	
Thallium, Dissolved	ug/L	1000	863	86	80-120	
Vanadium, Dissolved	ug/L	1000	1030	103	80-120	
Zinc, Dissolved	ug/L	1000	1080	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732190 2732191

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10407037011 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	ND	20000	20000	21800	22000	109	110	75-125	1	20
Antimony, Dissolved	ug/L	ND	1000	1000	1090	1080	109	108	75-125	1	20
Arsenic, Dissolved	ug/L	ND	1000	1000	1070	1080	107	108	75-125	1	20
Barium, Dissolved	ug/L	159	1000	1000	1210	1210	105	105	75-125	1	20
Beryllium, Dissolved	ug/L	ND	1000	1000	1060	1070	106	107	75-125	1	20
Cadmium, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20
Calcium, Dissolved	ug/L	143000	20000	20000	166000	165000	113	112	75-125	0	20
Chromium, Dissolved	ug/L	ND	1000	1000	1030	1040	103	104	75-125	1	20
Cobalt, Dissolved	ug/L	ND	1000	1000	1020	1020	101	102	75-125	1	20
Copper, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20
Iron, Dissolved	ug/L	62.8	20000	20000	20500	20800	102	103	75-125	1	20
Lead, Dissolved	ug/L	ND	1000	1000	1050	1060	105	105	75-125	1	20
Magnesium, Dissolved	ug/L	48000	20000	20000	69000	69100	105	106	75-125	0	20
Manganese, Dissolved	ug/L	175	1000	1000	1210	1220	104	105	75-125	1	20
Nickel, Dissolved	ug/L	ND	1000	1000	1010	1020	101	102	75-125	1	20
Potassium, Dissolved	ug/L	3930	20000	20000	26400	26400	112	113	75-125	0	20
Selenium, Dissolved	ug/L	ND	1000	1000	1100	1110	110	110	75-125	0	20
Silver, Dissolved	ug/L	ND	500	500	530	534	106	107	75-125	1	20
Sodium, Dissolved	ug/L	50300	20000	20000	72700	71900	112	108	75-125	1	20
Thallium, Dissolved	ug/L	ND	1000	1000	856	847	85	84	75-125	1	20
Vanadium, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20
Zinc, Dissolved	ug/L	ND	1000	1000	1050	1060	105	106	75-125	1	20

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch:	503942	Analysis Method:	SM 2320B
QC Batch Method:	SM 2320B	Analysis Description:	2320B Alkalinity
Associated Lab Samples:	10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010		

METHOD BLANK:	2739863	Matrix:	Water
Associated Lab Samples:	10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	10/23/17 08:12	

LABORATORY CONTROL SAMPLE & LCSD:		2739864	2739865							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.7	41.5	104	104	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2739866	2739867									
Parameter	Units	10407084005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	99.2	40	40	140	139	101	98	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2739868	2739869									
Parameter	Units	10407193003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	134	40	40	177	177	109	107	80-120	0	30	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch: 503397

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10407193001, 10407193002, 10407193003

METHOD BLANK: 2736704

Matrix: Water

Associated Lab Samples: 10407193001, 10407193002, 10407193003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/19/17 14:57	

LABORATORY CONTROL SAMPLE: 2736705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	956	96	80-120	

SAMPLE DUPLICATE: 2736706

Parameter	Units	10407193002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	439	433	1	10	

SAMPLE DUPLICATE: 2736707

Parameter	Units	10407193003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	283	291	3	10	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch: 503398

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

METHOD BLANK: 2736708

Matrix: Water

Associated Lab Samples: 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/19/17 16:23	

LABORATORY CONTROL SAMPLE: 2736709

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	960	96	80-120	

SAMPLE DUPLICATE: 2736710

Parameter	Units	10407193004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	324	327	1	10	

SAMPLE DUPLICATE: 2736711

Parameter	Units	10407193005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	248	240	3	10	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch: 92264 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

METHOD BLANK: 396654 Matrix: Water  
 Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	10/19/17 11:52	

LABORATORY CONTROL SAMPLE: 396655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	96	90-110	

MATRIX SPIKE SAMPLE: 396657

Parameter	Units	10407193001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	<0.0050	0	75-125 M1	

SAMPLE DUPLICATE: 396656

Parameter	Units	10407193001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

QC Batch: 502680 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

METHOD BLANK: 2732423 Matrix: Water  
Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	10/16/17 10:50	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	10/16/17 10:50	
Sulfate	mg/L	<0.27	1.2	0.27	10/16/17 10:50	

LABORATORY CONTROL SAMPLE: 2732424

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.2	98	90-110	
Nitrate as N	mg/L	1	0.94	94	90-110	
Sulfate	mg/L	12.5	11.3	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732425 2732426

Parameter	Units	7575437001		7575437002		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	3.6	12.5	12.5	15.4	15.4	94	94	90-110	0	20
Nitrate as N	mg/L	ND	1	1	0.99	0.99	92	92	90-110	0	20
Sulfate	mg/L	29.3	12.5	12.5	37.7	36.9	67	61	90-110	2	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732427 2732428

Parameter	Units	7575442001		7575442002		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	36.1	12.5	12.5	43.7	44.0	61	63	90-110	1	20 M1
Nitrate as N	mg/L	ND	1	1	0.95	0.96	95	96	90-110	0	20
Sulfate	mg/L	23.3	12.5	12.5	32.8	33.1	76	78	90-110	1	20 M1

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

QC Batch: 503436 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10407193001, 10407193002, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

METHOD BLANK: 2736853 Matrix: Water  
Associated Lab Samples: 10407193001, 10407193002, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/19/17 13:04	FS

LABORATORY CONTROL SAMPLE: 2736854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2736855 2736856

Parameter	Units	10407553001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.059	1	1	0.96	0.97	90	92	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2736857 2736858

Parameter	Units	10407553002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.35	1	1	1.3	1.2	93	90	90-110	2	20	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

QC Batch: 505223 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10407193003

METHOD BLANK: 2746322 Matrix: Water  
Associated Lab Samples: 10407193003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/28/17 16:05	FS

LABORATORY CONTROL SAMPLE: 2746323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2746324 2746325

Parameter	Units	10407647001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	ND	1	0.92	1	0.93	90	91	90-110	1	20	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2746326 2746327

Parameter	Units	10407647002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	ND	1	0.97	1	0.97	95	95	90-110	0	20	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

QC Batch: 502653 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

METHOD BLANK: 2732322 Matrix: Water  
Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007, 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	10/16/17 15:17	

LABORATORY CONTROL SAMPLE: 2732323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	300	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732324 2732325

Parameter	Units	10406955001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	5810	2500	2500	8310	8270	100	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732326 2732327

Parameter	Units	10406825004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	99.5	250	250	338	335	95	94	90-110	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch: 129201

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007

METHOD BLANK: 514343

Matrix: Water

Associated Lab Samples: 10407193001, 10407193002, 10407193003, 10407193004, 10407193005, 10407193006, 10407193007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/21/17 00:02	

LABORATORY CONTROL SAMPLE: 514344

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	23.5	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 514345 514346

Parameter	Units	10407125006		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	5.3	25	25	28.6	28.8	93	94	80-120	1	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 514347 514348

Parameter	Units	10407193002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	1.7	25	25	25.1	25.4	94	95	80-120	1	20				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

QC Batch: 129202

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10407193008, 10407193009, 10407193010

METHOD BLANK: 514356

Matrix: Water

Associated Lab Samples: 10407193008, 10407193009, 10407193010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/24/17 16:39	

LABORATORY CONTROL SAMPLE: 514357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.3	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 514358 514359

Parameter	Units	514358		514359		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10407193008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.42J	25	25	25.8	26.2	101	103	80-120	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 514360 514361

Parameter	Units	514360		514361		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10407193010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.78J	25	25	25.9	26.0	100	101	80-120	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10407193001	MW1S-GW-101217	RSK 175	502939		
10407193002	MW9S-GW-101217	RSK 175	502939		
10407193003	MW8S-GW-101217	RSK 175	502939		
10407193004	MW10S-GW-101217	RSK 175	502939		
10407193005	MW11S-GW-101217	RSK 175	502939		
10407193006	MW6U-GW-101217	RSK 175	502939		
10407193007	MW6S-GW-101217	RSK 175	502939		
10407193008	MW13S-GW-101217	RSK 175	502939		
10407193009	MW12S-GW-101217	RSK 175	502939		
10407193010	MW9U-GW-101217	RSK 175	502939		
10407193001	MW1S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193002	MW9S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193003	MW8S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193004	MW10S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193005	MW11S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193006	MW6U-GW-101217	EPA 3010	502617	6010C Met	502867
10407193007	MW6S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193008	MW13S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193009	MW12S-GW-101217	EPA 3010	502617	6010C Met	502867
10407193010	MW9U-GW-101217	EPA 3010	502617	6010C Met	502867
10407193001	MW1S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193002	MW9S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193003	MW8S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193004	MW10S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193005	MW11S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193006	MW6U-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193007	MW6S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193008	MW13S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193009	MW12S-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193010	MW9U-GW-101217	EPA 7470A	502619	EPA 7470A	502813
10407193001	MW1S-GW-101217	SM 2320B	503942		
10407193002	MW9S-GW-101217	SM 2320B	503942		
10407193003	MW8S-GW-101217	SM 2320B	503942		
10407193004	MW10S-GW-101217	SM 2320B	503942		
10407193005	MW11S-GW-101217	SM 2320B	503942		
10407193006	MW6U-GW-101217	SM 2320B	503942		
10407193007	MW6S-GW-101217	SM 2320B	503942		
10407193008	MW13S-GW-101217	SM 2320B	503942		
10407193009	MW12S-GW-101217	SM 2320B	503942		
10407193010	MW9U-GW-101217	SM 2320B	503942		
10407193001	MW1S-GW-101217	SM 2540C	503397		
10407193002	MW9S-GW-101217	SM 2540C	503397		
10407193003	MW8S-GW-101217	SM 2540C	503397		
10407193004	MW10S-GW-101217	SM 2540C	503398		
10407193005	MW11S-GW-101217	SM 2540C	503398		
10407193006	MW6U-GW-101217	SM 2540C	503398		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407193

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10407193007	MW6S-GW-101217	SM 2540C	503398		
10407193008	MW13S-GW-101217	SM 2540C	503398		
10407193009	MW12S-GW-101217	SM 2540C	503398		
10407193010	MW9U-GW-101217	SM 2540C	503398		
10407193001	MW1S-GW-101217	SM 4500-S-2 D	92264		
10407193002	MW9S-GW-101217	SM 4500-S-2 D	92264		
10407193003	MW8S-GW-101217	SM 4500-S-2 D	92264		
10407193004	MW10S-GW-101217	SM 4500-S-2 D	92264		
10407193005	MW11S-GW-101217	SM 4500-S-2 D	92264		
10407193006	MW6U-GW-101217	SM 4500-S-2 D	92264		
10407193007	MW6S-GW-101217	SM 4500-S-2 D	92264		
10407193008	MW13S-GW-101217	SM 4500-S-2 D	92264		
10407193009	MW12S-GW-101217	SM 4500-S-2 D	92264		
10407193010	MW9U-GW-101217	SM 4500-S-2 D	92264		
10407193001	MW1S-GW-101217	EPA 300.0	502680		
10407193002	MW9S-GW-101217	EPA 300.0	502680		
10407193003	MW8S-GW-101217	EPA 300.0	502680		
10407193004	MW10S-GW-101217	EPA 300.0	502680		
10407193005	MW11S-GW-101217	EPA 300.0	502680		
10407193006	MW6U-GW-101217	EPA 300.0	502680		
10407193007	MW6S-GW-101217	EPA 300.0	502680		
10407193008	MW13S-GW-101217	EPA 300.0	502680		
10407193009	MW12S-GW-101217	EPA 300.0	502680		
10407193010	MW9U-GW-101217	EPA 300.0	502680		
10407193001	MW1S-GW-101217	EPA 353.2	503436		
10407193002	MW9S-GW-101217	EPA 353.2	503436		
10407193003	MW8S-GW-101217	EPA 353.2	505223		
10407193004	MW10S-GW-101217	EPA 353.2	503436		
10407193005	MW11S-GW-101217	EPA 353.2	503436		
10407193006	MW6U-GW-101217	EPA 353.2	503436		
10407193007	MW6S-GW-101217	EPA 353.2	503436		
10407193008	MW13S-GW-101217	EPA 353.2	503436		
10407193009	MW12S-GW-101217	EPA 353.2	503436		
10407193010	MW9U-GW-101217	EPA 353.2	503436		
10407193001	MW1S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193002	MW9S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193003	MW8S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193004	MW10S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193005	MW11S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193006	MW6U-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193007	MW6S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193008	MW13S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193009	MW12S-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193010	MW9U-GW-101217	EPA 410.4	502653	EPA 410.4	502797
10407193001	MW1S-GW-101217	SM 5310C	129201		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

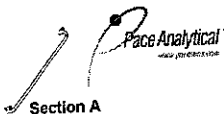
Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407193

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10407193002	MW9S-GW-101217	SM 5310C	129201		
10407193003	MW8S-GW-101217	SM 5310C	129201		
10407193004	MW10S-GW-101217	SM 5310C	129201		
10407193005	MW11S-GW-101217	SM 5310C	129201		
10407193006	MW6U-GW-101217	SM 5310C	129201		
10407193007	MW6S-GW-101217	SM 5310C	129201		
10407193008	MW13S-GW-101217	SM 5310C	129202		
10407193009	MW12S-GW-101217	SM 5310C	129202		
10407193010	MW9U-GW-101217	SM 5310C	129202		

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# CHAIN-OF-CUSTODY / Analytical Request Document

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10407193

<b>Section A</b>		<b>Section B</b>		<b>Section C</b>	
<b>Required Client Information:</b>		<b>Required Project Information:</b>		<b>Invoice Information:</b>	
Company: UPRR		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Theriault (atheria@up.com)	
Address: 1400 W. 52nd Ave. Denver, CO 80221		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email: atheria@up.com		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone: _____ Fax: _____		Purchase Order #		Pace Quote: Contract# 758938	
Requested Due Date: 24 Hr / 3 Day / 10 Day		Project Name: Freeman, WA - Cenex Harvest Lease		Pace Project Manager: Jennifer Gross	
		Project #:		Pace Profile #: 36447 / 4	
				Regulatory Agency	
				State / Location	
				WA / Freeman	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see yield codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						ANALYSES TEST Y/N	Requested Analysis Filtered (Y/N)	Y	
						START DATE TIME	END DATE TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other				Low Level VOCs by 8260
1	MW1S-GW-101217					10/12	14:10		11	X	X	X	X						001
2	MW9S-GW-101217						13:40		10										002
3	MW8S-GW-101217						13:20												003
4	MW10S-GW-101217						12:15												004
5	MW11S-GW-101217						11:50												005
6	MW6U-GW-101217						11:20												006
7	MW6S-GW-101217						10:55												007
8	MW13S-GW-101217						10:20												008
9	MW12S-GW-101217						9:35												009
10	MW9U-GW-101217					9:00			4										010
11	Trip Blank																		one per cock-011
12																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*Field filtered by client	<i>[Signature]</i>	10-13-17	15:35	<i>[Signature]</i>	10/14/17	9:15	* Y Y Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:					
SIGNATURE of SAMPLER:					
DATE Signed:					

# 49,27,4-3,4-3



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email:		Purchase Order # PEDD# 1497		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone:		Project Name: Freeman WA-Grain Handling Facility		Pace Quote: Contract# 758938	
Requested Due Date: <b>10 Day Standard</b>		Project #: 1497		Pace Project Manager: Jennifer Gross	
				Pace Profile #: 36447 / 4	

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Y	Requested Analysis Filtered (Y/N)																	
						DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other			Analyses Test	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals *	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethane RSK175	COD 410.4	Nitrate+Nitrite 353.2	MS/MSD Requested						
1	MW1S-GW-101217			WTG	G	10/13/17		1410		8		X	X	X	X																						
2	MW9S-GW-101217							1340		8																											
3	MW8S-GW-101217							1320		8																											
4	MW10S-GW-101217							1215		8																											
5	MW11S-GW-101217							1150		8																											
6	MW6U-GW-101217							1120		8																											
7	MW6S-GW-101217							1055		8																											
8	MW13S-GW-101217							1020		8																											
9	MW12S-GW-101217							0935		8																											
10	MW9U-GW-101217							0900		8																											
11	<del>Trip Blank</del>							<del>0700</del>		<del>8</del>																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	CH2M	10-13-17	15:35							
*Field filtered by client										

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Steve Demus						
SIGNATURE of SAMPLER: [Signature] for Steve Demus						
DATE Signed: 10-16-17						



**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** UPRR      **Project #:** \_\_\_\_\_

WO# : 10407193

10407193

**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_

**Tracking Number:** 744810328046, 744810328068, 744810328079, 744810328057

**Custody Seal on Cooler/Box Present?**  Yes     No    **Seals Intact?**  Yes     No

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: PS

**Thermometer**  151401163     G87A9155100842    **Temp Blank?**  Yes     No

**Used:** 5.1, 2.7, 4.3, 4.5    **Type of Ice:**  Wet     Blue     None     Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 5.1, 2.7, 4.3, 4.5    **Cooler Temp Corrected (°C):** 4.9, 2.7, 4.3, 4.3    **Biological Tissue Frozen?**  Yes     No     N/A

Temp should be above freezing to 6°C    **Correction Factor:** -0.2    **Date and Initials of Person Examining Contents:** 10/17/17

**USDA Regulated Soil**  N/A, water sample)    Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>WT</u> <u>BC 10-14-17</u>	12. Wrong analysis on COC
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # <u>1-10</u> <u>1/1</u> <u>1/1</u>
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____    Lot # of added preservative: _____
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>See exception sheet</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): <u>W/IT</u>	

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**  Yes     No

Person Contacted: Lindsey Baumann      Date/Time: 10/17/17

Comments/Resolution: Received revised COCs

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1135</u>	Temp: <u>5.1, 2.7</u>	Corrected Temp: <u>4.9</u>
Time: <u>1155</u>	put in cooler <u>4.5</u>	<u>4.3</u>
Time: _____	Temp: <u>4.1, 4.4</u>	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS      **Date:** 10/17/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
<i>headspace</i>	<i>MW85-GW-10217</i>	<i>3/3 069H</i>
<i>headspace</i>	<i>MW90-GW-10217</i>	<i>2/3 069H</i>
<i>headspace</i>	<i>trip blank</i>	<i>4/4 069H</i>

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

Chain of Custody

**WO#: 1299075**  
 PM: HRZ Due Date: 11/01/17  
 CLIENT: PACE MPLS

Page 64 of 67

Workorder: 10407193 Workorder Name: Freeman WA-Cenex Harvest Lease Owner Received Date: 10/14/2017 Results Requested By: 10/30/2017

Report To	Subcontract To	Requested Analysis														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426	Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042															

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers												LAB USE ONLY
						H2SO4												
1	MW1S-GW-101217	PS	10/12/2017 14:10	10407193001	Water	1										X		
2	MW9S-GW-101217	PS	10/12/2017 13:40	10407193002	Water	1										X		
3	MW8S-GW-101217	PS	10/12/2017 13:20	10407193003	Water	1										X		
4	MW10S-GW-101217	PS	10/12/2017 12:15	10407193004	Water	1										X		
5	MW11S-GW-101217	PS	10/12/2017 11:50	10407193005	Water	1										X		
6	MW6U-GW-101217	PS	10/12/2017 11:20	10407193006	Water	1										X		
7	MW6S-GW-101217	PS	10/12/2017 10:55	10407193007	Water	1										X		
8	MW13S-GW-101217	PS	10/12/2017 10:20	10407193008	Water	1										X		
9	MW12S-GW-101217	PS	10/12/2017 09:35	10407193009	Water	1										X		
10	MW9U-GW-101217	PS	10/12/2017 09:00	10407193010	Water	1										X		

Transfers						Comments											
Released By	Date/Time	Received By	Date/Time														
<i>[Signature]</i> Pace MN	10/17/17 1345	<i>[Signature]</i>	10/17/17 19 <sup>00</sup>														
	10/17/17 23 <sup>00</sup>	<i>[Signature]</i>	10/18/17 09 <sup>28</sup>														

Cooler Temperature on Receipt *4.9* °C      Custody Seal  or N      Received on Ice  or N      Samples Intact  or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace mll

Project #:

**WO# : 1299075**  
**PM: HRZ**      **Due Date: 11/01/17**  
**CLIENT: PACE MPLS**

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes     No      Seals Intact?  Yes     No      Optional:    Proj. Due Date:    Proj. Name:

Packing Material:  Bubble Wrap     Bubble Bags     None     Other: Haerpac      Temp Blank?  Yes     No

Thermometer Used:  140792808      Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.6      Cooler Temp Corrected °C: 0.9      Biological Tissue Frozen?  Yes     No     N/A  
Temp should be above freezing to 6°C    Correction Factor: -1.3      Date and Initials of Person Examining Contents: JPL 10/17/17

Comments: 10/18/17 al

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE    Y    N

TEMPERATURE WAIVER ON FILE    Y    N

Project Manager Review: [Signature]      Date: 10-18-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Custody

WO#: 2063616



Workorder: 10407193

Workorder Name: Freeman WA-Cenex Harvest Lease

Owner Received Date: 10/14/2017 Results Requested By: 10/30/2017

Report To		Subcontract To					Requested Analysis																							
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					<div style="display: flex; justify-content: space-between;"> <span>5636267 / 4500 Sulfide</span> <span>LAB USE ONLY</span> </div>																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other											Preserved Containers													
1	MW1S-GW-101217	PS	10/12/2017 14:10	10407193001	Water	1															X									
2	MW9S-GW-101217	PS	10/12/2017 13:40	10407193002	Water	1															X									
3	MW8S-GW-101217	PS	10/12/2017 13:20	10407193003	Water	1															X									
4	MW10S-GW-101217	PS	10/12/2017 12:15	10407193004	Water	1															X									
5	MW11S-GW-101217	PS	10/12/2017 11:50	10407193005	Water	1															X									
6	MW6U-GW-101217	PS	10/12/2017 11:20	10407193006	Water	1															X									
7	MW6S-GW-101217	PS	10/12/2017 10:55	10407193007	Water	1															X									
8	MW13S-GW-101217	PS	10/12/2017 10:20	10407193008	Water	1															X									
9	MW12S-GW-101217	PS	10/12/2017 09:35	10407193009	Water	1															X									
10	MW9U-GW-101217	PS	10/12/2017 09:00	10407193010	Water	1					X																			
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																								
1		<i>[Signature]</i> Pace MN	10/17/17 1345			0900																								
2		<i>[Signature]</i>	10-18-17	<i>[Signature]</i> / Pace	10-18-17																									
3																														
Cooler Temperature on Receipt		1.0 °C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact											Y or N										

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Rec

# WO#: 2063616

PM: CMM

Due Date: 11/01/17

CLIENT: PASI-MINN

Project: \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10-19-17 B

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

October 23, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

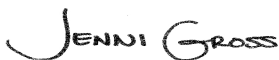
RE: Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407351

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407351

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970  
Wyoming via EPA Region 8 Certification #: 8TMS-L

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10407351001	MW1S-GW-101217	Water	10/12/17 14:10	10/14/17 09:15
10407351002	MW9S-GW-101217	Water	10/12/17 13:40	10/14/17 09:15
10407351003	MW8S-GW-101217	Water	10/12/17 13:20	10/14/17 09:15
10407351004	MW10S-GW-101217	Water	10/12/17 12:15	10/14/17 09:15
10407351005	MW11S-GW-101217	Water	10/12/17 11:50	10/14/17 09:15
10407351006	MW6U-GW-101217	Water	10/12/17 11:20	10/14/17 09:15
10407351007	MW6S-GW-101217	Water	10/12/17 10:55	10/14/17 09:15
10407351008	MW13S-GW-101217	Water	10/12/17 10:20	10/14/17 09:15
10407351009	MW12S-GW-101217	Water	10/12/17 09:35	10/14/17 09:15
10407351010	MW9U-GW-101217	Water	10/12/17 09:00	10/14/17 09:15
10407193011	Trip Blank	Water	10/12/17 00:00	10/14/17 09:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10407351001	MW1S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351002	MW9S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351003	MW8S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351004	MW10S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351005	MW11S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351006	MW6U-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351007	MW6S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351008	MW13S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351009	MW12S-GW-101217	EPA 8260B	DJB	83	PASI-M
10407351010	MW9U-GW-101217	EPA 8260B	DJB	83	PASI-M
10407193011	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10407351001</b>	<b>MW1S-GW-101217</b>					
EPA 8260B	Acetone	38.7	ug/L	20.0	10/19/17 04:05	
<b>10407351002</b>	<b>MW9S-GW-101217</b>					
EPA 8260B	Acetone	67.0J	ug/L	100	10/19/17 07:36	
EPA 8260B	Carbon disulfide	2.4J	ug/L	5.0	10/19/17 07:36	
EPA 8260B	Carbon tetrachloride	557	ug/L	2.5	10/19/17 07:36	
EPA 8260B	Chloroform	72.5	ug/L	5.0	10/19/17 07:36	
EPA 8260B	Toluene	40.8	ug/L	2.5	10/19/17 07:36	
<b>10407351003</b>	<b>MW8S-GW-101217</b>					
EPA 8260B	Acetone	38.3	ug/L	20.0	10/19/17 20:21	
EPA 8260B	Carbon disulfide	1.0J	ug/L	1.0	10/19/17 20:21	
EPA 8260B	Carbon tetrachloride	208	ug/L	0.50	10/19/17 20:21	
EPA 8260B	Chloroform	51.7	ug/L	1.0	10/19/17 20:21	
<b>10407351004</b>	<b>MW10S-GW-101217</b>					
EPA 8260B	Acetone	29.5	ug/L	20.0	10/19/17 04:29	
EPA 8260B	Carbon tetrachloride	1.9	ug/L	0.50	10/19/17 04:29	
<b>10407351005</b>	<b>MW11S-GW-101217</b>					
EPA 8260B	Acetone	45.7	ug/L	20.0	10/19/17 04:52	
<b>10407351006</b>	<b>MW6U-GW-101217</b>					
EPA 8260B	Acetone	21.1	ug/L	20.0	10/19/17 06:02	
EPA 8260B	Carbon tetrachloride	40.3	ug/L	0.50	10/19/17 06:02	
EPA 8260B	Chloroform	1.6	ug/L	1.0	10/19/17 06:02	
<b>10407351007</b>	<b>MW6S-GW-101217</b>					
EPA 8260B	1,2,4-Trimethylbenzene	1.2	ug/L	1.0	10/19/17 05:15	
EPA 8260B	1,3,5-Trimethylbenzene	0.26J	ug/L	0.50	10/19/17 05:15	
EPA 8260B	Acetone	34.6	ug/L	20.0	10/19/17 05:15	
<b>10407351008</b>	<b>MW13S-GW-101217</b>					
EPA 8260B	Acetone	20.6	ug/L	20.0	10/19/17 05:39	
<b>10407351009</b>	<b>MW12S-GW-101217</b>					
EPA 8260B	1,2,4-Trimethylbenzene	1.1	ug/L	1.0	10/19/17 19:34	
EPA 8260B	1,3,5-Trimethylbenzene	0.18J	ug/L	0.50	10/19/17 19:34	
EPA 8260B	Acetone	50.7	ug/L	20.0	10/19/17 19:34	
<b>10407351010</b>	<b>MW9U-GW-101217</b>					
EPA 8260B	Acetone	34.8	ug/L	20.0	10/19/17 19:58	
EPA 8260B	Carbon disulfide	2.0	ug/L	1.0	10/19/17 19:58	
EPA 8260B	Carbon tetrachloride	639	ug/L	2.5	10/20/17 08:27	
EPA 8260B	Chloroform	17.3	ug/L	1.0	10/19/17 19:58	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407351

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**Method:** EPA 8260B  
**Description:** 8260B MSV Low Level  
**Client:** UPRR\_CH2M Hill  
**Date:** October 23, 2017

### General Information:

11 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 503304

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2735559)
  - Bromomethane
- DUP (Lab ID: 2735563)
  - Bromomethane
- LCS (Lab ID: 2735560)
  - Bromomethane
- LCSD (Lab ID: 2735561)
  - Bromomethane
- MS (Lab ID: 2735614)
  - Bromomethane
- MW10S-GW-101217 (Lab ID: 10407351004)
  - Bromomethane
- MW11S-GW-101217 (Lab ID: 10407351005)
  - Bromomethane
- MW13S-GW-101217 (Lab ID: 10407351008)
  - Bromomethane
- MW1S-GW-101217 (Lab ID: 10407351001)
  - Bromomethane
- MW6S-GW-101217 (Lab ID: 10407351007)
  - Bromomethane
- MW6U-GW-101217 (Lab ID: 10407351006)
  - Bromomethane
- MW9S-GW-101217 (Lab ID: 10407351002)
  - Bromomethane
- Trip Blank (Lab ID: 10407193011)
  - Bromomethane

QC Batch: 503428

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- BLANK (Lab ID: 2736807)
  - Bromomethane

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 23, 2017

QC Batch: 503428

CL: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

- LCS (Lab ID: 2736808)
  - Bromomethane
- LCSD (Lab ID: 2736809)
  - Bromomethane
- MS (Lab ID: 2736810)
  - Bromomethane
- MSD (Lab ID: 2736811)
  - Bromomethane
- MW12S-GW-101217 (Lab ID: 10407351009)
  - Bromomethane
- MW8S-GW-101217 (Lab ID: 10407351003)
  - Bromomethane
- MW9U-GW-101217 (Lab ID: 10407351010)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 503304

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 2735559)
  - Toluene

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 503304

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCSD (Lab ID: 2735561)
  - Naphthalene

QC Batch: 503428

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCSD (Lab ID: 2736809)
  - Naphthalene

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 23, 2017

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 503304

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 503428

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 1298789013

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2736810)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2736811)
  - Acetone
  - Tetrahydrofuran

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

Analyte Comments:

QC Batch: 503304

P8: Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

- BLANK (Lab ID: 2735559)
  - Toluene

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: **MW1S-GW-101217** Lab ID: **10407351001** Collected: 10/12/17 14:10 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 04:05	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 04:05	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 04:05	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 04:05	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:05	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:05	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 04:05	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:05	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 04:05	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 04:05	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 04:05	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 04:05	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 04:05	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 04:05	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 04:05	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:05	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:05	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 04:05	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 04:05	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 04:05	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 04:05	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 04:05	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 04:05	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 04:05	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 04:05	108-10-1	
Acetone	38.7	ug/L	20.0	8.8	1		10/19/17 04:05	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 04:05	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 04:05	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:05	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 04:05	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 04:05	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 04:05	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 04:05	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 04:05	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/19/17 04:05	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 04:05	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 04:05	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 04:05	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: **MW1S-GW-101217** Lab ID: **10407351001** Collected: 10/12/17 14:10 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 04:05	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 04:05	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 04:05	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 04:05	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 04:05	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 04:05	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 04:05	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 04:05	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:05	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 04:05	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 04:05	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 04:05	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 04:05	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 04:05	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 04:05	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 04:05	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:05	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 04:05	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:05	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:05	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 04:05	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 04:05	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:05	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 04:05	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 04:05	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 04:05	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 04:05	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:05	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 04:05	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		10/19/17 04:05	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/19/17 04:05	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		10/19/17 04:05	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW9S-GW-101217**      **Lab ID: 10407351002**      Collected: 10/12/17 13:40      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.72	ug/L	2.5	0.72	5		10/19/17 07:36	630-20-6	
1,1,1-Trichloroethane	<0.76	ug/L	2.5	0.76	5		10/19/17 07:36	71-55-6	
1,1,2,2-Tetrachloroethane	<0.94	ug/L	2.5	0.94	5		10/19/17 07:36	79-34-5	
1,1,2-Trichloroethane	<1.1	ug/L	2.5	1.1	5		10/19/17 07:36	79-00-5	
1,1,2-Trichlorotrifluoroethane	<1.4	ug/L	5.0	1.4	5		10/19/17 07:36	76-13-1	
1,1-Dichloroethane	<0.72	ug/L	2.5	0.72	5		10/19/17 07:36	75-34-3	
1,1-Dichloroethene	<0.90	ug/L	2.5	0.90	5		10/19/17 07:36	75-35-4	
1,1-Dichloropropene	<0.88	ug/L	2.5	0.88	5		10/19/17 07:36	563-58-6	
1,2,3-Trichlorobenzene	<0.72	ug/L	2.5	0.72	5		10/19/17 07:36	87-61-6	
1,2,3-Trichloropropane	<3.3	ug/L	20.0	3.3	5		10/19/17 07:36	96-18-4	
1,2,4-Trichlorobenzene	<0.89	ug/L	2.5	0.89	5		10/19/17 07:36	120-82-1	
1,2,4-Trimethylbenzene	<0.49	ug/L	5.0	0.49	5		10/19/17 07:36	95-63-6	
1,2-Dibromo-3-chloropropane	<5.2	ug/L	20.0	5.2	5		10/19/17 07:36	96-12-8	
1,2-Dibromoethane (EDB)	<0.86	ug/L	2.5	0.86	5		10/19/17 07:36	106-93-4	
1,2-Dichlorobenzene	<1.0	ug/L	2.5	1.0	5		10/19/17 07:36	95-50-1	
1,2-Dichloroethane	<0.76	ug/L	2.5	0.76	5		10/19/17 07:36	107-06-2	
1,2-Dichloroethene (Total)	<2.1	ug/L	5.0	2.1	5		10/19/17 07:36	540-59-0	
1,2-Dichloropropane	<3.1	ug/L	20.0	3.1	5		10/19/17 07:36	78-87-5	
1,3,5-Trimethylbenzene	<0.90	ug/L	2.5	0.90	5		10/19/17 07:36	108-67-8	
1,3-Dichlorobenzene	<0.80	ug/L	2.5	0.80	5		10/19/17 07:36	541-73-1	
1,3-Dichloropropane	<0.64	ug/L	2.5	0.64	5		10/19/17 07:36	142-28-9	
1,4-Dichlorobenzene	<0.52	ug/L	2.5	0.52	5		10/19/17 07:36	106-46-7	
1,4-Dioxane (p-Dioxane)	<113	ug/L	1000	113	5		10/19/17 07:36	123-91-1	
2,2,4-Trimethylpentane	<6.5	ug/L	20.0	6.5	5		10/19/17 07:36	540-84-1	
2,2-Dichloropropane	<2.0	ug/L	5.0	2.0	5		10/19/17 07:36	594-20-7	
2-Butanone (MEK)	<12.1	ug/L	25.0	12.1	5		10/19/17 07:36	78-93-3	
2-Chlorotoluene	<1.0	ug/L	2.5	1.0	5		10/19/17 07:36	95-49-8	
2-Hexanone	<12.4	ug/L	25.0	12.4	5		10/19/17 07:36	591-78-6	
4-Chlorotoluene	<0.66	ug/L	2.5	0.66	5		10/19/17 07:36	106-43-4	
4-Methyl-2-pentanone (MIBK)	<2.7	ug/L	25.0	2.7	5		10/19/17 07:36	108-10-1	
Acetone	67.0J	ug/L	100	44.2	5		10/19/17 07:36	67-64-1	
Acrolein	<24.2	ug/L	50.0	24.2	5		10/19/17 07:36	107-02-8	
Acrylonitrile	<24.4	ug/L	50.0	24.4	5		10/19/17 07:36	107-13-1	
Benzene	<0.63	ug/L	2.5	0.63	5		10/19/17 07:36	71-43-2	
Bromobenzene	<0.78	ug/L	2.5	0.78	5		10/19/17 07:36	108-86-1	
Bromochloromethane	<1.9	ug/L	5.0	1.9	5		10/19/17 07:36	74-97-5	
Bromodichloromethane	<1.0	ug/L	2.5	1.0	5		10/19/17 07:36	75-27-4	
Bromoform	<5.2	ug/L	20.0	5.2	5		10/19/17 07:36	75-25-2	
Bromomethane	<7.7	ug/L	20.0	7.7	5		10/19/17 07:36	74-83-9	CL
Carbon disulfide	2.4J	ug/L	5.0	1.9	5		10/19/17 07:36	75-15-0	
Carbon tetrachloride	557	ug/L	2.5	1.0	5		10/19/17 07:36	56-23-5	
Chlorobenzene	<0.68	ug/L	2.5	0.68	5		10/19/17 07:36	108-90-7	
Chloroethane	<2.2	ug/L	5.0	2.2	5		10/19/17 07:36	75-00-3	
Chloroform	72.5	ug/L	5.0	2.3	5		10/19/17 07:36	67-66-3	
Chloromethane	<5.4	ug/L	20.0	5.4	5		10/19/17 07:36	74-87-3	
Dibromochloromethane	<0.67	ug/L	2.5	0.67	5		10/19/17 07:36	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW9S-GW-101217**      **Lab ID: 10407351002**      Collected: 10/12/17 13:40      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<2.5	ug/L	5.0	2.5	5		10/19/17 07:36	74-95-3	
Dichlorodifluoromethane	<1.6	ug/L	5.0	1.6	5		10/19/17 07:36	75-71-8	
Dichlorofluoromethane	<1.9	ug/L	5.0	1.9	5		10/19/17 07:36	75-43-4	
Diisopropyl ether	<0.62	ug/L	5.0	0.62	5		10/19/17 07:36	108-20-3	
Ethyl-tert-butyl ether	<0.64	ug/L	2.5	0.64	5		10/19/17 07:36	637-92-3	
Ethylbenzene	<0.68	ug/L	2.5	0.68	5		10/19/17 07:36	100-41-4	
Hexachloro-1,3-butadiene	<2.4	ug/L	5.0	2.4	5		10/19/17 07:36	87-68-3	
Isopropylbenzene (Cumene)	<0.70	ug/L	2.5	0.70	5		10/19/17 07:36	98-82-8	
Methyl-tert-butyl ether	<0.72	ug/L	2.5	0.72	5		10/19/17 07:36	1634-04-4	
Methylene Chloride	<5.8	ug/L	20.0	5.8	5		10/19/17 07:36	75-09-2	
Naphthalene	<2.1	ug/L	5.0	2.1	5		10/19/17 07:36	91-20-3	
Styrene	<0.72	ug/L	5.0	0.72	5		10/19/17 07:36	100-42-5	
Tetrachloroethene	<0.79	ug/L	2.5	0.79	5		10/19/17 07:36	127-18-4	
Tetrahydrofuran	<21.6	ug/L	50.0	21.6	5		10/19/17 07:36	109-99-9	
Toluene	40.8	ug/L	2.5	0.86	5		10/19/17 07:36	108-88-3	
Trichloroethene	<0.91	ug/L	2.0	0.91	5		10/19/17 07:36	79-01-6	
Trichlorofluoromethane	<0.64	ug/L	2.5	0.64	5		10/19/17 07:36	75-69-4	
Vinyl acetate	<7.4	ug/L	50.0	7.4	5		10/19/17 07:36	108-05-4	
Vinyl chloride	<0.48	ug/L	1.0	0.48	5		10/19/17 07:36	75-01-4	
Xylene (Total)	<1.2	ug/L	7.5	1.2	5		10/19/17 07:36	1330-20-7	
cis-1,2-Dichloroethene	<1.0	ug/L	2.5	1.0	5		10/19/17 07:36	156-59-2	
cis-1,3-Dichloropropene	<0.58	ug/L	2.5	0.58	5		10/19/17 07:36	10061-01-5	
m&p-Xylene	<1.2	ug/L	5.0	1.2	5		10/19/17 07:36	179601-23-1	
n-Butylbenzene	<0.66	ug/L	2.5	0.66	5		10/19/17 07:36	104-51-8	
n-Propylbenzene	<0.62	ug/L	2.5	0.62	5		10/19/17 07:36	103-65-1	
o-Xylene	<0.54	ug/L	2.5	0.54	5		10/19/17 07:36	95-47-6	
p-Isopropyltoluene	<0.70	ug/L	5.0	0.70	5		10/19/17 07:36	99-87-6	
sec-Butylbenzene	<0.62	ug/L	2.5	0.62	5		10/19/17 07:36	135-98-8	
tert-Amylmethyl ether	<0.58	ug/L	2.5	0.58	5		10/19/17 07:36	994-05-8	
tert-Butyl Alcohol	<11.0	ug/L	50.0	11.0	5		10/19/17 07:36	75-65-0	
tert-Butylbenzene	<0.74	ug/L	2.5	0.74	5		10/19/17 07:36	98-06-6	
trans-1,2-Dichloroethene	<1.0	ug/L	2.5	1.0	5		10/19/17 07:36	156-60-5	
trans-1,3-Dichloropropene	<0.68	ug/L	2.5	0.68	5		10/19/17 07:36	10061-02-6	
trans-1,4-Dichloro-2-butene	<14.2	ug/L	50.0	14.2	5		10/19/17 07:36	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		5		10/19/17 07:36	17060-07-0	
Toluene-d8 (S)	100	%	75-125		5		10/19/17 07:36	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		5		10/19/17 07:36	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: MW8S-GW-101217 Lab ID: 10407351003 Collected: 10/12/17 13:20 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 20:21	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 20:21	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 20:21	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 20:21	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 20:21	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 20:21	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 20:21	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 20:21	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 20:21	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 20:21	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 20:21	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 20:21	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 20:21	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 20:21	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 20:21	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 20:21	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 20:21	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 20:21	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 20:21	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 20:21	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 20:21	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 20:21	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 20:21	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 20:21	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 20:21	108-10-1	
Acetone	38.3	ug/L	20.0	8.8	1		10/19/17 20:21	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 20:21	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 20:21	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 20:21	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 20:21	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 20:21	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 20:21	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 20:21	74-83-9	CL
Carbon disulfide	1.0J	ug/L	1.0	0.37	1		10/19/17 20:21	75-15-0	
Carbon tetrachloride	208	ug/L	0.50	0.20	1		10/19/17 20:21	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 20:21	75-00-3	
Chloroform	51.7	ug/L	1.0	0.46	1		10/19/17 20:21	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 20:21	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	124-48-1	

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### ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW8S-GW-101217**      **Lab ID: 10407351003**      Collected: 10/12/17 13:20      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 20:21	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 20:21	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 20:21	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 20:21	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 20:21	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 20:21	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 20:21	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 20:21	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 20:21	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 20:21	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 20:21	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 20:21	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 20:21	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 20:21	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 20:21	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 20:21	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 20:21	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 20:21	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 20:21	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 20:21	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 20:21	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 20:21	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 20:21	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 20:21	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 20:21	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 20:21	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 20:21	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 20:21	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 20:21	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		10/19/17 20:21	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/19/17 20:21	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/19/17 20:21	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: **MW10S-GW-101217** Lab ID: **10407351004** Collected: 10/12/17 12:15 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 04:29	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 04:29	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 04:29	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 04:29	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:29	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:29	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 04:29	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:29	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 04:29	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 04:29	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 04:29	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 04:29	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 04:29	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 04:29	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 04:29	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:29	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:29	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 04:29	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 04:29	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 04:29	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 04:29	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 04:29	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 04:29	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 04:29	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 04:29	108-10-1	
Acetone	29.5	ug/L	20.0	8.8	1		10/19/17 04:29	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 04:29	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 04:29	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:29	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 04:29	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 04:29	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 04:29	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 04:29	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 04:29	75-15-0	
Carbon tetrachloride	1.9	ug/L	0.50	0.20	1		10/19/17 04:29	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 04:29	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 04:29	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 04:29	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW10S-GW-101217**      **Lab ID: 10407351004**      Collected: 10/12/17 12:15      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 04:29	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 04:29	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 04:29	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 04:29	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 04:29	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 04:29	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 04:29	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 04:29	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:29	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 04:29	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 04:29	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 04:29	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 04:29	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 04:29	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 04:29	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 04:29	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:29	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 04:29	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:29	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:29	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 04:29	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 04:29	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:29	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 04:29	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 04:29	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 04:29	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 04:29	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:29	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 04:29	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		1		10/19/17 04:29	17060-07-0	HS
Toluene-d8 (S)	98	%	75-125		1		10/19/17 04:29	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		10/19/17 04:29	460-00-4	

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### ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: MW11S-GW-101217 Lab ID: 10407351005 Collected: 10/12/17 11:50 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 04:52	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 04:52	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 04:52	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 04:52	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:52	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:52	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 04:52	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:52	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 04:52	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 04:52	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 04:52	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 04:52	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 04:52	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 04:52	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 04:52	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 04:52	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:52	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 04:52	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 04:52	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 04:52	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 04:52	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 04:52	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 04:52	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 04:52	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 04:52	108-10-1	
Acetone	45.7	ug/L	20.0	8.8	1		10/19/17 04:52	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 04:52	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 04:52	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:52	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 04:52	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 04:52	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 04:52	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 04:52	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 04:52	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/19/17 04:52	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 04:52	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 04:52	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 04:52	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample:** MW11S-GW-101217      **Lab ID:** 10407351005      Collected: 10/12/17 11:50      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 04:52	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 04:52	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 04:52	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 04:52	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 04:52	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 04:52	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 04:52	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 04:52	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 04:52	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 04:52	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 04:52	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 04:52	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 04:52	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 04:52	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 04:52	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 04:52	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:52	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 04:52	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 04:52	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:52	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 04:52	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 04:52	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 04:52	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 04:52	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 04:52	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 04:52	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 04:52	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 04:52	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 04:52	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		1		10/19/17 04:52	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/19/17 04:52	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		10/19/17 04:52	460-00-4	

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### ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: MW6U-GW-101217 Lab ID: 10407351006 Collected: 10/12/17 11:20 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 06:02	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 06:02	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 06:02	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 06:02	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 06:02	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 06:02	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 06:02	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 06:02	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 06:02	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 06:02	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 06:02	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 06:02	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 06:02	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 06:02	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 06:02	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 06:02	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 06:02	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 06:02	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 06:02	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 06:02	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 06:02	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 06:02	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 06:02	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 06:02	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 06:02	108-10-1	
Acetone	21.1	ug/L	20.0	8.8	1		10/19/17 06:02	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 06:02	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 06:02	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 06:02	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 06:02	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 06:02	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 06:02	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 06:02	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 06:02	75-15-0	
Carbon tetrachloride	40.3	ug/L	0.50	0.20	1		10/19/17 06:02	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 06:02	75-00-3	
Chloroform	1.6	ug/L	1.0	0.46	1		10/19/17 06:02	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 06:02	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW6U-GW-101217**      **Lab ID: 10407351006**      Collected: 10/12/17 11:20      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 06:02	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 06:02	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 06:02	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 06:02	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 06:02	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 06:02	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 06:02	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 06:02	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 06:02	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 06:02	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 06:02	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 06:02	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 06:02	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 06:02	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 06:02	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 06:02	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 06:02	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 06:02	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 06:02	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 06:02	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 06:02	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 06:02	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 06:02	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 06:02	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 06:02	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 06:02	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 06:02	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 06:02	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 06:02	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		10/19/17 06:02	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/19/17 06:02	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/19/17 06:02	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: **MW6S-GW-101217** Lab ID: **10407351007** Collected: 10/12/17 10:55 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 05:15	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 05:15	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 05:15	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 05:15	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:15	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:15	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 05:15	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:15	120-82-1	
1,2,4-Trimethylbenzene	1.2	ug/L	1.0	0.098	1		10/19/17 05:15	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 05:15	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 05:15	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 05:15	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 05:15	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 05:15	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 05:15	78-87-5	
1,3,5-Trimethylbenzene	0.26J	ug/L	0.50	0.18	1		10/19/17 05:15	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 05:15	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 05:15	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 05:15	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 05:15	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 05:15	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 05:15	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 05:15	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 05:15	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 05:15	108-10-1	
Acetone	34.6	ug/L	20.0	8.8	1		10/19/17 05:15	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 05:15	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 05:15	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 05:15	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 05:15	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 05:15	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 05:15	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 05:15	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 05:15	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/19/17 05:15	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 05:15	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 05:15	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 05:15	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW6S-GW-101217**      **Lab ID: 10407351007**      Collected: 10/12/17 10:55      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 05:15	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 05:15	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 05:15	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 05:15	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 05:15	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 05:15	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 05:15	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 05:15	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 05:15	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 05:15	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 05:15	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 05:15	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 05:15	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 05:15	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 05:15	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 05:15	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 05:15	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 05:15	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 05:15	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 05:15	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 05:15	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 05:15	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 05:15	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 05:15	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 05:15	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 05:15	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 05:15	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:15	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 05:15	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		10/19/17 05:15	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/19/17 05:15	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		10/19/17 05:15	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: MW13S-GW-101217 Lab ID: 10407351008 Collected: 10/12/17 10:20 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 05:39	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 05:39	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 05:39	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 05:39	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:39	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:39	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 05:39	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:39	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 05:39	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 05:39	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 05:39	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 05:39	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 05:39	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 05:39	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 05:39	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 05:39	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 05:39	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 05:39	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 05:39	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 05:39	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 05:39	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 05:39	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 05:39	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 05:39	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 05:39	108-10-1	
Acetone	20.6	ug/L	20.0	8.8	1		10/19/17 05:39	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 05:39	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 05:39	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 05:39	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 05:39	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 05:39	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 05:39	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 05:39	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 05:39	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/19/17 05:39	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 05:39	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 05:39	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 05:39	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW13S-GW-101217**      **Lab ID: 10407351008**      Collected: 10/12/17 10:20      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 05:39	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 05:39	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 05:39	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 05:39	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 05:39	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 05:39	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 05:39	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 05:39	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 05:39	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 05:39	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 05:39	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 05:39	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 05:39	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 05:39	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 05:39	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 05:39	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 05:39	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 05:39	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 05:39	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 05:39	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 05:39	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 05:39	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 05:39	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 05:39	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 05:39	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 05:39	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 05:39	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 05:39	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 05:39	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		10/19/17 05:39	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/19/17 05:39	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1		10/19/17 05:39	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: MW12S-GW-101217 Lab ID: 10407351009 Collected: 10/12/17 09:35 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 19:34	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 19:34	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 19:34	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 19:34	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:34	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:34	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 19:34	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:34	120-82-1	
1,2,4-Trimethylbenzene	1.1	ug/L	1.0	0.098	1		10/19/17 19:34	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 19:34	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 19:34	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 19:34	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 19:34	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 19:34	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 19:34	78-87-5	
1,3,5-Trimethylbenzene	0.18J	ug/L	0.50	0.18	1		10/19/17 19:34	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 19:34	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 19:34	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 19:34	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 19:34	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 19:34	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 19:34	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 19:34	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 19:34	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 19:34	108-10-1	
Acetone	50.7	ug/L	20.0	8.8	1		10/19/17 19:34	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 19:34	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 19:34	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 19:34	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 19:34	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 19:34	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 19:34	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 19:34	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 19:34	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/19/17 19:34	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 19:34	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 19:34	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 19:34	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW12S-GW-101217**      **Lab ID: 10407351009**      Collected: 10/12/17 09:35      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 19:34	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 19:34	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 19:34	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 19:34	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 19:34	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 19:34	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 19:34	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 19:34	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 19:34	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 19:34	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 19:34	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 19:34	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 19:34	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 19:34	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 19:34	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 19:34	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 19:34	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 19:34	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 19:34	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 19:34	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 19:34	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 19:34	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 19:34	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 19:34	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 19:34	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 19:34	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 19:34	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:34	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 19:34	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	103	%	75-137		1		10/19/17 19:34	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/19/17 19:34	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		10/19/17 19:34	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: **MW9U-GW-101217** Lab ID: **10407351010** Collected: 10/12/17 09:00 Received: 10/14/17 09:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 19:58	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 19:58	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 19:58	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 19:58	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:58	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:58	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 19:58	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:58	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 19:58	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 19:58	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 19:58	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 19:58	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 19:58	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 19:58	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 19:58	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 19:58	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 19:58	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 19:58	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 19:58	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 19:58	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 19:58	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 19:58	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 19:58	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 19:58	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 19:58	108-10-1	
Acetone	34.8	ug/L	20.0	8.8	1		10/19/17 19:58	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 19:58	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 19:58	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 19:58	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 19:58	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 19:58	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 19:58	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 19:58	74-83-9	CL
Carbon disulfide	2.0	ug/L	1.0	0.37	1		10/19/17 19:58	75-15-0	
Carbon tetrachloride	639	ug/L	2.5	1.0	5		10/20/17 08:27	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 19:58	75-00-3	
Chloroform	17.3	ug/L	1.0	0.46	1		10/19/17 19:58	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 19:58	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: MW9U-GW-101217**      **Lab ID: 10407351010**      Collected: 10/12/17 09:00      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 19:58	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 19:58	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 19:58	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 19:58	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 19:58	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 19:58	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 19:58	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 19:58	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 19:58	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 19:58	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 19:58	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 19:58	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 19:58	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 19:58	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 19:58	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 19:58	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 19:58	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 19:58	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 19:58	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 19:58	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 19:58	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 19:58	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 19:58	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 19:58	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 19:58	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 19:58	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 19:58	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 19:58	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 19:58	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		10/19/17 19:58	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/19/17 19:58	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/19/17 19:58	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Sample: Trip Blank      Lab ID: 10407193011      Collected: 10/12/17 00:00      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 00:11	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/19/17 00:11	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/19/17 00:11	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/19/17 00:11	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/19/17 00:11	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/19/17 00:11	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/19/17 00:11	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 00:11	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		10/19/17 00:11	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/19/17 00:11	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/19/17 00:11	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/19/17 00:11	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/19/17 00:11	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/19/17 00:11	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/19/17 00:11	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/19/17 00:11	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 00:11	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/19/17 00:11	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/19/17 00:11	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/19/17 00:11	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/19/17 00:11	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/19/17 00:11	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/19/17 00:11	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/19/17 00:11	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/19/17 00:11	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		10/19/17 00:11	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		10/19/17 00:11	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/19/17 00:11	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/19/17 00:11	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 00:11	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/19/17 00:11	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/19/17 00:11	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/19/17 00:11	74-83-9	CL
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/19/17 00:11	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/19/17 00:11	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/19/17 00:11	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/19/17 00:11	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/19/17 00:11	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	124-48-1	

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### ANALYTICAL RESULTS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

**Sample: Trip Blank**      **Lab ID: 10407193011**      Collected: 10/12/17 00:00      Received: 10/14/17 09:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/19/17 00:11	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/19/17 00:11	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/19/17 00:11	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/19/17 00:11	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/19/17 00:11	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/19/17 00:11	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/19/17 00:11	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/19/17 00:11	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/19/17 00:11	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/19/17 00:11	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/19/17 00:11	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/19/17 00:11	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/19/17 00:11	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/19/17 00:11	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/19/17 00:11	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/19/17 00:11	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		10/19/17 00:11	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/19/17 00:11	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/19/17 00:11	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 00:11	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/19/17 00:11	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	1.0	0.14	1		10/19/17 00:11	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/19/17 00:11	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/19/17 00:11	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/19/17 00:11	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/19/17 00:11	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/19/17 00:11	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		10/19/17 00:11	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/19/17 00:11	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	93	%	75-137		1		10/19/17 00:11	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		10/19/17 00:11	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1		10/19/17 00:11	460-00-4	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

QC Batch: 503304 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10407193011, 10407351001, 10407351002, 10407351004, 10407351005, 10407351006, 10407351007, 10407351008

METHOD BLANK: 2735559 Matrix: Water  
 Associated Lab Samples: 10407193011, 10407351001, 10407351002, 10407351004, 10407351005, 10407351006, 10407351007, 10407351008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/18/17 23:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/18/17 23:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/18/17 23:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/18/17 23:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/18/17 23:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/18/17 23:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/18/17 23:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/18/17 23:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	10/18/17 23:24	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/18/17 23:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/18/17 23:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/18/17 23:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/18/17 23:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/18/17 23:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/18/17 23:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/18/17 23:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/18/17 23:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/18/17 23:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/18/17 23:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/18/17 23:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/18/17 23:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/18/17 23:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/18/17 23:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/18/17 23:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/18/17 23:24	
Acetone	ug/L	<8.8	20.0	8.8	10/18/17 23:24	
Acrolein	ug/L	<4.8	10.0	4.8	10/18/17 23:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/18/17 23:24	
Benzene	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/18/17 23:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/18/17 23:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/18/17 23:24	
Bromoform	ug/L	<1.0	4.0	1.0	10/18/17 23:24	
Bromomethane	ug/L	<1.5	4.0	1.5	10/18/17 23:24	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/18/17 23:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

METHOD BLANK: 2735559

Matrix: Water

Associated Lab Samples: 10407193011, 10407351001, 10407351002, 10407351004, 10407351005, 10407351006, 10407351007, 10407351008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/18/17 23:24	
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
Chloroethane	ug/L	<0.44	1.0	0.44	10/18/17 23:24	
Chloroform	ug/L	<0.46	1.0	0.46	10/18/17 23:24	
Chloromethane	ug/L	<1.1	4.0	1.1	10/18/17 23:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/18/17 23:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	10/18/17 23:24	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/18/17 23:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/18/17 23:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/18/17 23:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/18/17 23:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/18/17 23:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/18/17 23:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/18/17 23:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/18/17 23:24	
Naphthalene	ug/L	<0.42	1.0	0.42	10/18/17 23:24	
o-Xylene	ug/L	<0.11	0.50	0.11	10/18/17 23:24	
p-Isopropyltoluene	ug/L	<0.14	1.0	0.14	10/18/17 23:24	MN
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/18/17 23:24	
Styrene	ug/L	<0.14	1.0	0.14	10/18/17 23:24	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/18/17 23:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/18/17 23:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/18/17 23:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/18/17 23:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/18/17 23:24	
Toluene	ug/L	0.64	0.50	0.17	10/18/17 23:24	P8
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/18/17 23:24	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	10/18/17 23:24	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/18/17 23:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/18/17 23:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/18/17 23:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/18/17 23:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/18/17 23:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/18/17 23:24	
1,2-Dichloroethane-d4 (S)	%	103	75-137		10/18/17 23:24	
4-Bromofluorobenzene (S)	%	103	75-125		10/18/17 23:24	
Toluene-d8 (S)	%	95	75-125		10/18/17 23:24	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

LABORATORY CONTROL SAMPLE & LCSD: 2735560

2735561

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.1	19.5	95	98	75-136	2	30	
1,1,1-Trichloroethane	ug/L	20	20.7	21.5	104	107	75-129	4	30	
1,1,2,2-Tetrachloroethane	ug/L	20	19.8	19.9	99	100	71-138	1	30	
1,1,2-Trichloroethane	ug/L	20	18.8	19.3	94	96	75-125	2	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	19.1	19.6	96	98	69-126	3	30	
1,1-Dichloroethane	ug/L	20	19.5	20.4	98	102	75-125	5	30	
1,1-Dichloroethene	ug/L	20	19.6	20.0	98	100	75-125	2	30	
1,1-Dichloropropene	ug/L	20	21.0	21.8	105	109	75-125	4	30	
1,2,3-Trichlorobenzene	ug/L	20	20.0	23.9	100	120	75-125	18	30	
1,2,3-Trichloropropane	ug/L	20	20.0	19.7	100	99	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	21.9	23.3	109	117	75-125	6	30	
1,2,4-Trimethylbenzene	ug/L	20	18.9	19.7	94	98	75-125	4	30	
1,2-Dibromo-3-chloropropane	ug/L	50	51.2	52.9	102	106	71-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	20	20.8	21.4	104	107	75-125	3	30	
1,2-Dichlorobenzene	ug/L	20	20.9	21.0	104	105	75-125	1	30	
1,2-Dichloroethane	ug/L	20	17.4	17.6	87	88	70-125	1	30	
1,2-Dichloroethene (Total)	ug/L	40	39.5	41.5	99	104	75-125	5	30	
1,2-Dichloropropane	ug/L	20	18.8	19.6	94	98	75-125	5	30	
1,3,5-Trimethylbenzene	ug/L	20	20.5	20.6	103	103	75-125	0	30	
1,3-Dichlorobenzene	ug/L	20	19.4	19.5	97	97	75-125	1	30	
1,3-Dichloropropane	ug/L	20	20.1	20.7	101	104	75-125	3	30	
1,4-Dichlorobenzene	ug/L	20	20.1	20.5	101	103	75-125	2	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	377	394	94	98	64-140	4	30	
2,2,4-Trimethylpentane	ug/L	20	20.0	18.4	100	92	68-125	8	30	
2,2-Dichloropropane	ug/L	20	18.6	20.0	93	100	70-131	7	30	
2-Butanone (MEK)	ug/L	100	84.7	86.5	85	86	69-125	2	30	
2-Chlorotoluene	ug/L	20	19.8	20.2	99	101	75-125	2	30	
2-Hexanone	ug/L	100	94.2	94.7	94	95	73-129	1	30	
4-Chlorotoluene	ug/L	20	21.0	21.1	105	106	75-125	1	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	91.9	94.1	92	94	73-125	2	30	
Acetone	ug/L	100	114	115	114	115	66-126	1	30	
Acrolein	ug/L	200	178	177	89	89	56-150	0	30	
Acrylonitrile	ug/L	200	183	187	92	94	68-129	2	30	
Benzene	ug/L	20	20.1	20.6	100	103	75-125	3	30	
Bromobenzene	ug/L	20	20.1	19.9	100	99	75-125	1	30	
Bromochloromethane	ug/L	20	20.1	19.6	100	98	75-126	2	30	
Bromodichloromethane	ug/L	20	19.5	20.3	97	101	75-133	4	30	
Bromoform	ug/L	20	18.5	18.8	92	94	62-142	2	30	
Bromomethane	ug/L	20	7.7	9.7	39	49	34-143	23	30	CL
Carbon disulfide	ug/L	20	19.0	19.5	95	98	71-125	3	30	
Carbon tetrachloride	ug/L	20	19.0	19.7	95	99	71-145	4	30	
Chlorobenzene	ug/L	20	19.6	20.2	98	101	75-125	3	30	
Chloroethane	ug/L	20	18.0	17.8	90	89	75-125	1	30	
Chloroform	ug/L	20	18.7	19.4	94	97	75-125	4	30	
Chloromethane	ug/L	20	14.4	14.1	72	71	54-125	2	30	
cis-1,2-Dichloroethene	ug/L	20	19.9	21.5	100	107	75-125	8	30	
cis-1,3-Dichloropropene	ug/L	20	17.8	18.2	89	91	75-125	3	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

LABORATORY CONTROL SAMPLE & LCSD: 2735560

2735561

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	19.6	20.0	98	100	74-141	2	30	
Dibromomethane	ug/L	20	19.4	19.0	97	95	75-125	2	30	
Dichlorodifluoromethane	ug/L	20	20.3	20.8	102	104	59-130	2	30	
Dichlorofluoromethane	ug/L	20	20.9	21.4	105	107	75-125	2	30	
Diisopropyl ether	ug/L	20	17.9	18.2	90	91	69-125	1	30	
Ethyl-tert-butyl ether	ug/L	20	20.2	20.4	101	102	73-125	1	30	
Ethylbenzene	ug/L	20	20.4	21.3	102	106	75-125	4	30	
Hexachloro-1,3-butadiene	ug/L	20	20.6	20.4	103	102	75-131	1	30	
Isopropylbenzene (Cumene)	ug/L	20	19.8	20.5	99	103	75-125	4	30	
m&p-Xylene	ug/L	40	37.4	39.3	94	98	75-125	5	30	
Methyl-tert-butyl ether	ug/L	20	19.7	19.7	98	99	75-125	0	30	
Methylene Chloride	ug/L	20	18.8	19.0	94	95	73-125	1	30	
n-Butylbenzene	ug/L	20	21.4	21.1	107	106	75-125	1	30	
n-Propylbenzene	ug/L	20	21.5	21.8	107	109	75-125	2	30	
Naphthalene	ug/L	20	21.5	25.2	107	126	74-125	16	30	L3
o-Xylene	ug/L	20	20.7	21.5	103	108	75-125	4	30	
p-Isopropyltoluene	ug/L	20	19.5	19.8	98	99	75-125	2	30	
sec-Butylbenzene	ug/L	20	20.4	20.7	102	103	75-125	1	30	
Styrene	ug/L	20	18.9	19.7	95	98	75-125	4	30	
tert-Amylmethyl ether	ug/L	20	20.1	20.3	100	102	71-126	1	30	
tert-Butyl Alcohol	ug/L	200	196	206	98	103	69-131	5	30	
tert-Butylbenzene	ug/L	20	21.4	21.7	107	108	75-125	1	30	
Tetrachloroethene	ug/L	20	18.9	20.0	95	100	75-125	6	30	
Tetrahydrofuran	ug/L	200	237	242	118	121	65-127	2	30	
Toluene	ug/L	20	18.9	19.4	95	97	75-125	3	30	
trans-1,2-Dichloroethene	ug/L	20	19.6	20.0	98	100	75-125	2	30	
trans-1,3-Dichloropropene	ug/L	20	18.3	18.5	91	93	75-125	1	30	
trans-1,4-Dichloro-2-butene	ug/L	50	44.4	44.5	89	89	30-150	0	30	
Trichloroethene	ug/L	20	19.0	19.2	95	96	75-125	1	30	
Trichlorofluoromethane	ug/L	20	20.7	21.3	104	107	71-140	3	30	
Vinyl acetate	ug/L	20	17.7	17.5	88	88	68-137	1	30	
Vinyl chloride	ug/L	20	20.5	20.4	103	102	70-125	0	30	
Xylene (Total)	ug/L	60	58.1	60.8	97	101	75-125	5	30	
1,2-Dichloroethane-d4 (S)	%				95	92	75-137			
4-Bromofluorobenzene (S)	%				101	103	75-125			
Toluene-d8 (S)	%				100	100	75-125			

MATRIX SPIKE SAMPLE: 2735614

Parameter	Units	10407523002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	19.0	95	75-137	
1,1,1-Trichloroethane	ug/L	<0.15	20	20.8	104	75-139	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	19.3	97	60-142	
1,1,2-Trichloroethane	ug/L	<0.22	20	18.0	90	75-128	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	19.9	99	62-150	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

MATRIX SPIKE SAMPLE: 2735614		10407523002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	19.8	99	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	20.5	103	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	21.4	107	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	22.5	113	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	19.4	97	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	21.6	108	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	17.8	89	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	51.7	103	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20.4	102	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	19.9	99	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	16.9	84	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	39.5	99	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	18.4	92	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	19.6	98	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	18.3	91	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	19.4	97	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	19.1	96	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	392	98	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	19.6	98	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	18.9	94	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	83.0	83	58-125	
2-Chlorotoluene	ug/L	<0.20	20	18.7	93	65-138	
2-Hexanone	ug/L	<2.5	100	90.7	91	61-134	
4-Chlorotoluene	ug/L	<0.13	20	19.8	99	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	88.7	89	61-130	
Acetone	ug/L	<8.8	100	191	191	51-140	M1
Acrolein	ug/L	<4.8	200	173	87	48-150	
Acrylonitrile	ug/L	<4.9	200	174	87	55-134	
Benzene	ug/L	<0.13	20	20.2	101	63-132	
Bromobenzene	ug/L	<0.16	20	19.3	96	67-138	
Bromochloromethane	ug/L	<0.38	20	19.7	99	66-138	
Bromodichloromethane	ug/L	<0.20	20	19.6	98	75-137	
Bromoform	ug/L	<1.0	20	18.2	91	65-129	
Bromomethane	ug/L	<1.5	20	11.5	58	41-150	CL
Carbon disulfide	ug/L	<0.37	20	19.5	98	72-132	
Carbon tetrachloride	ug/L	<0.20	20	19.2	96	75-150	
Chlorobenzene	ug/L	<0.14	20	19.0	95	73-127	
Chloroethane	ug/L	<0.44	20	20.1	101	74-138	
Chloroform	ug/L	<0.46	20	18.7	93	74-125	
Chloromethane	ug/L	<1.1	20	14.3	71	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	19.7	99	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	17.3	86	66-129	
Dibromochloromethane	ug/L	<0.13	20	19.2	96	75-133	
Dibromomethane	ug/L	<0.50	20	18.3	92	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	21.7	108	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.9	104	75-129	
Diisopropyl ether	ug/L	<0.12	20	17.4	87	62-128	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

MATRIX SPIKE SAMPLE: 2735614

Parameter	Units	10407523002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	20.0	100	63-132	
Ethylbenzene	ug/L	<0.14	20	19.0	95	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	18.9	95	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	18.5	93	70-136	
m&p-Xylene	ug/L	<0.24	40	35.9	90	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	18.8	94	72-125	
Methylene Chloride	ug/L	<1.2	20	20.1	96	60-132	
n-Butylbenzene	ug/L	<0.13	20	19.8	99	60-150	
n-Propylbenzene	ug/L	<0.12	20	19.4	97	63-142	
Naphthalene	ug/L	<0.42	20	24.1	121	67-125	
o-Xylene	ug/L	<0.11	20	20.2	101	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	17.7	89	64-146	
sec-Butylbenzene	ug/L	<0.12	20	18.8	94	67-144	
Styrene	ug/L	<0.14	20	18.1	90	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	19.6	98	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	196	98	56-146	
tert-Butylbenzene	ug/L	<0.15	20	19.4	97	68-135	
Tetrachloroethene	ug/L	<0.16	20	18.6	93	67-148	
Tetrahydrofuran	ug/L	<4.3	200	395	198	51-141 M1	
Toluene	ug/L	<0.17	20	18.3	92	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	19.7	99	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	17.5	88	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	41.6	83	30-150	
Trichloroethene	ug/L	<0.18	20	18.6	93	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	21.4	107	75-150	
Vinyl acetate	ug/L	<1.5	20	15.7	79	49-143	
Vinyl chloride	ug/L	<0.096	20	21.4	107	75-133	
Xylene (Total)	ug/L	<0.24	60	56.1	94	63-142	
1,2-Dichloroethane-d4 (S)	%				92	75-137	
4-Bromofluorobenzene (S)	%				101	75-125	
Toluene-d8 (S)	%				97	75-125	

SAMPLE DUPLICATE: 2735563

Parameter	Units	10407519002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

SAMPLE DUPLICATE: 2735563

Parameter	Units	10407519002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	CL
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

SAMPLE DUPLICATE: 2735563

Parameter	Units	10407519002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	98	102	4		
4-Bromofluorobenzene (S)	%	104	101	2		
Toluene-d8 (S)	%	96	98	1		

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407351

QC Batch: 503428 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10407351003, 10407351009, 10407351010

METHOD BLANK: 2736807 Matrix: Water  
Associated Lab Samples: 10407351003, 10407351009, 10407351010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/19/17 12:33	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/19/17 12:33	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/19/17 12:33	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/19/17 12:33	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/19/17 12:33	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/19/17 12:33	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/19/17 12:33	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/19/17 12:33	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	10/19/17 12:33	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/19/17 12:33	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/19/17 12:33	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/19/17 12:33	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/19/17 12:33	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/19/17 12:33	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/19/17 12:33	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/19/17 12:33	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/19/17 12:33	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/19/17 12:33	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/19/17 12:33	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/19/17 12:33	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/19/17 12:33	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/19/17 12:33	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/19/17 12:33	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/19/17 12:33	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/19/17 12:33	
Acetone	ug/L	<8.8	20.0	8.8	10/19/17 12:33	
Acrolein	ug/L	<4.8	10.0	4.8	10/19/17 12:33	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/19/17 12:33	
Benzene	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/19/17 12:33	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/19/17 12:33	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/19/17 12:33	
Bromoform	ug/L	<1.0	4.0	1.0	10/19/17 12:33	
Bromomethane	ug/L	<1.5	4.0	1.5	10/19/17 12:33	CL
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/19/17 12:33	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/19/17 12:33	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

METHOD BLANK: 2736807

Matrix: Water

Associated Lab Samples: 10407351003, 10407351009, 10407351010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
Chloroethane	ug/L	<0.44	1.0	0.44	10/19/17 12:33	
Chloroform	ug/L	<0.46	1.0	0.46	10/19/17 12:33	
Chloromethane	ug/L	<1.1	4.0	1.1	10/19/17 12:33	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/19/17 12:33	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	10/19/17 12:33	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/19/17 12:33	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/19/17 12:33	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/19/17 12:33	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/19/17 12:33	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/19/17 12:33	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/19/17 12:33	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/19/17 12:33	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/19/17 12:33	
Naphthalene	ug/L	<0.42	1.0	0.42	10/19/17 12:33	
o-Xylene	ug/L	<0.11	0.50	0.11	10/19/17 12:33	
p-Isopropyltoluene	ug/L	<0.14	1.0	0.14	10/19/17 12:33	MN
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/19/17 12:33	
Styrene	ug/L	<0.14	1.0	0.14	10/19/17 12:33	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/19/17 12:33	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/19/17 12:33	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/19/17 12:33	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/19/17 12:33	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/19/17 12:33	
Toluene	ug/L	<0.17	0.50	0.17	10/19/17 12:33	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/19/17 12:33	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	10/19/17 12:33	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/19/17 12:33	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/19/17 12:33	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/19/17 12:33	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/19/17 12:33	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/19/17 12:33	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/19/17 12:33	
1,2-Dichloroethane-d4 (S)	%	112	75-137		10/19/17 12:33	
4-Bromofluorobenzene (S)	%	101	75-125		10/19/17 12:33	
Toluene-d8 (S)	%	101	75-125		10/19/17 12:33	

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

LABORATORY CONTROL SAMPLE & LCSD: 2736808

2736809

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.6	19.4	98	97	75-136	1	30	
1,1,1-Trichloroethane	ug/L	20	18.5	18.8	93	94	75-129	2	30	
1,1,2,2-Tetrachloroethane	ug/L	20	21.6	20.9	108	104	71-138	3	30	
1,1,2-Trichloroethane	ug/L	20	19.8	20.0	99	100	75-125	1	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.6	17.5	88	88	69-126	0	30	
1,1-Dichloroethane	ug/L	20	18.1	18.4	90	92	75-125	2	30	
1,1-Dichloroethene	ug/L	20	17.3	17.7	86	89	75-125	3	30	
1,1-Dichloropropene	ug/L	20	19.7	19.3	98	96	75-125	2	30	
1,2,3-Trichlorobenzene	ug/L	20	22.8	23.9	114	119	75-125	4	30	
1,2,3-Trichloropropane	ug/L	20	21.0	21.6	105	108	75-125	3	30	
1,2,4-Trichlorobenzene	ug/L	20	22.4	22.4	112	112	75-125	0	30	
1,2,4-Trimethylbenzene	ug/L	20	18.6	18.9	93	94	75-125	1	30	
1,2-Dibromo-3-chloropropane	ug/L	50	57.5	56.0	115	112	71-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	20	21.9	21.9	109	110	75-125	0	30	
1,2-Dichlorobenzene	ug/L	20	20.5	21.1	102	105	75-125	3	30	
1,2-Dichloroethane	ug/L	20	17.4	18.1	87	91	70-125	4	30	
1,2-Dichloroethene (Total)	ug/L	40	35.2	35.7	88	89	75-125	2	30	
1,2-Dichloropropane	ug/L	20	20.0	19.8	100	99	75-125	1	30	
1,3,5-Trimethylbenzene	ug/L	20	19.1	20.4	96	102	75-125	7	30	
1,3-Dichlorobenzene	ug/L	20	19.1	19.5	95	98	75-125	2	30	
1,3-Dichloropropane	ug/L	20	21.4	21.5	107	108	75-125	1	30	
1,4-Dichlorobenzene	ug/L	20	20.1	20.0	100	100	75-125	1	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	389	418	97	105	64-140	7	30	
2,2,4-Trimethylpentane	ug/L	20	18.7	19.0	93	95	68-125	2	30	
2,2-Dichloropropane	ug/L	20	18.7	19.1	94	95	70-131	2	30	
2-Butanone (MEK)	ug/L	100	102	96.2	102	96	69-125	6	30	
2-Chlorotoluene	ug/L	20	19.3	20.1	97	100	75-125	4	30	
2-Hexanone	ug/L	100	126	116	126	116	73-129	8	30	
4-Chlorotoluene	ug/L	20	20.3	20.7	101	104	75-125	2	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	121	114	121	114	73-125	6	30	
Acetone	ug/L	100	126	109	126	109	66-126	15	30	
Acrolein	ug/L	200	200	197	100	99	56-150	1	30	
Acrylonitrile	ug/L	200	200	196	100	98	68-129	2	30	
Benzene	ug/L	20	19.7	19.5	98	98	75-125	1	30	
Bromobenzene	ug/L	20	19.8	20.3	99	102	75-125	3	30	
Bromochloromethane	ug/L	20	17.8	18.9	89	95	75-126	6	30	
Bromodichloromethane	ug/L	20	19.4	19.4	97	97	75-133	0	30	
Bromoform	ug/L	20	20.1	19.7	101	98	62-142	2	30	
Bromomethane	ug/L	20	11.8	13.3	59	66	34-143	12	30	CL
Carbon disulfide	ug/L	20	16.4	16.3	82	82	71-125	1	30	
Carbon tetrachloride	ug/L	20	17.8	18.0	89	90	71-145	1	30	
Chlorobenzene	ug/L	20	20.4	20.4	102	102	75-125	0	30	
Chloroethane	ug/L	20	17.1	17.6	86	88	75-125	3	30	
Chloroform	ug/L	20	16.9	17.6	85	88	75-125	4	30	
Chloromethane	ug/L	20	12.7	13.8	63	69	54-125	8	30	
cis-1,2-Dichloroethene	ug/L	20	17.8	18.1	89	90	75-125	2	30	
cis-1,3-Dichloropropene	ug/L	20	18.5	18.5	92	93	75-125	0	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease  
Pace Project No.: 10407351

LABORATORY CONTROL SAMPLE & LCSD:		2736808		2736809							
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.9	20.2	104	101	74-141	3	30		
Dibromomethane	ug/L	20	20.2	20.2	101	101	75-125	0	30		
Dichlorodifluoromethane	ug/L	20	19.0	19.2	95	96	59-130	1	30		
Dichlorofluoromethane	ug/L	20	18.7	19.2	93	96	75-125	3	30		
Diisopropyl ether	ug/L	20	18.2	18.4	91	92	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	19.1	19.6	96	98	73-125	2	30		
Ethylbenzene	ug/L	20	20.4	20.6	102	103	75-125	1	30		
Hexachloro-1,3-butadiene	ug/L	20	22.0	20.2	110	101	75-131	8	30		
Isopropylbenzene (Cumene)	ug/L	20	19.9	19.6	99	98	75-125	2	30		
m&p-Xylene	ug/L	40	39.0	38.0	98	95	75-125	3	30		
Methyl-tert-butyl ether	ug/L	20	18.4	18.9	92	95	75-125	3	30		
Methylene Chloride	ug/L	20	16.8	17.2	84	86	73-125	2	30		
n-Butylbenzene	ug/L	20	20.2	20.7	101	103	75-125	2	30		
n-Propylbenzene	ug/L	20	20.5	20.8	102	104	75-125	2	30		
Naphthalene	ug/L	20	24.5	25.8	123	129	74-125	5	30	L3	
o-Xylene	ug/L	20	20.6	20.9	103	104	75-125	1	30		
p-Isopropyltoluene	ug/L	20	19.0	19.2	95	96	75-125	1	30		
sec-Butylbenzene	ug/L	20	19.6	19.9	98	99	75-125	2	30		
Styrene	ug/L	20	19.2	18.9	96	95	75-125	1	30		
tert-Amylmethyl ether	ug/L	20	20.0	20.3	100	101	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	202	208	101	104	69-131	3	30		
tert-Butylbenzene	ug/L	20	20.5	20.3	102	102	75-125	1	30		
Tetrachloroethene	ug/L	20	21.8	20.6	109	103	75-125	5	30		
Tetrahydrofuran	ug/L	200	252	219	126	110	65-127	14	30		
Toluene	ug/L	20	19.1	19.0	95	95	75-125	0	30		
trans-1,2-Dichloroethene	ug/L	20	17.4	17.6	87	88	75-125	2	30		
trans-1,3-Dichloropropene	ug/L	20	20.0	19.7	100	99	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	49.5	46.3	99	93	30-150	7	30		
Trichloroethene	ug/L	20	19.1	19.1	96	96	75-125	0	30		
Trichlorofluoromethane	ug/L	20	18.9	19.2	95	96	71-140	1	30		
Vinyl acetate	ug/L	20	19.3	19.3	97	96	68-137	0	30		
Vinyl chloride	ug/L	20	19.8	20.1	99	100	70-125	1	30		
Xylene (Total)	ug/L	60	59.6	58.9	99	98	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				93	96	75-137				
4-Bromofluorobenzene (S)	%				101	104	75-125				
Toluene-d8 (S)	%				101	103	75-125				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2736810		2736811								
Parameter	Units	1298789013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	<0.50	20	20	17.2	18.8	86	94	75-137	9	30	
1,1,1-Trichloroethane	ug/L	<0.50	20	20	21.7	20.6	108	103	75-139	5	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.50	20	20	18.3	19.5	91	98	60-142	7	30	
1,1,2-Trichloroethane	ug/L	<0.50	20	20	16.9	18.0	84	90	75-128	6	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2736810		2736811									
Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		1298789013	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
1,1,2-Trichlorotrifluoroethane	ug/L	<1.0	20	20	22.2	20.6	111	103	62-150	8	30		
1,1-Dichloroethane	ug/L	<0.50	20	20	20.5	19.8	103	99	70-129	3	30		
1,1-Dichloroethene	ug/L	<0.50	20	20	20.8	19.8	104	99	67-141	5	30		
1,1-Dichloropropene	ug/L	<0.50	20	20	21.7	20.9	109	105	64-144	4	30		
1,2,3-Trichlorobenzene	ug/L	<0.50	20	20	23.1	23.6	116	118	66-139	2	30		
1,2,3-Trichloropropane	ug/L	<4.0	20	20	18.6	19.2	93	96	69-134	3	30		
1,2,4-Trichlorobenzene	ug/L	<0.50	20	20	22.7	22.5	114	113	65-138	1	30		
1,2,4-Trimethylbenzene	ug/L	<1.0	20	20	18.3	18.8	92	94	65-143	3	30		
1,2-Dibromo-3-chloropropane	ug/L	<4.0	50	50	48.4	51.2	97	102	61-134	6	30		
1,2-Dibromoethane (EDB)	ug/L	<0.50	20	20	18.7	19.7	94	98	74-129	5	30		
1,2-Dichlorobenzene	ug/L	<0.50	20	20	18.8	20.3	94	101	68-135	8	30		
1,2-Dichloroethane	ug/L	<0.50	20	20	18.4	18.0	91	89	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<1.0	40	40	40.0	38.2	100	95	69-134	5	30		
1,2-Dichloropropane	ug/L	<4.0	20	20	18.8	19.6	94	98	64-130	4	30		
1,3,5-Trimethylbenzene	ug/L	<0.50	20	20	19.9	20.6	99	103	64-146	3	30		
1,3-Dichlorobenzene	ug/L	<0.50	20	20	18.1	19.0	91	95	69-135	5	30		
1,3-Dichloropropane	ug/L	<0.50	20	20	18.5	19.8	93	99	67-128	7	30		
1,4-Dichlorobenzene	ug/L	<0.50	20	20	18.8	19.6	94	98	66-134	4	30		
1,4-Dioxane (p-Dioxane)	ug/L	<200	400	400	346	353	86	88	58-140	2	30		
2,2,4-Trimethylpentane	ug/L	<4.0	20	20	26.6	23.4	133	117	48-150	13	30		
2,2-Dichloropropane	ug/L	<1.0	20	20	21.9	20.7	110	103	50-150	6	30		
2-Butanone (MEK)	ug/L	<5.0	100	100	91.3	91.7	91	92	58-125	0	30		
2-Chlorotoluene	ug/L	<0.50	20	20	19.1	19.8	95	99	65-138	4	30		
2-Hexanone	ug/L	<5.0	100	100	94.1	102	94	102	61-134	8	30		
4-Chlorotoluene	ug/L	<0.50	20	20	19.5	20.8	98	104	68-135	6	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	100	100	92.9	101	93	101	61-130	9	30		
Acetone	ug/L	<20.0	100	100	173	177	159	163	51-140	3	30	M1	
Acrolein	ug/L	<10.0	200	200	186	185	93	92	48-150	1	30		
Acrylonitrile	ug/L	<10.0	200	200	182	183	91	91	55-134	1	30		
Benzene	ug/L	<0.50	20	20	20.8	20.1	103	99	63-132	3	30		
Bromobenzene	ug/L	<0.50	20	20	18.8	19.6	94	98	67-138	4	30		
Bromochloromethane	ug/L	<1.0	20	20	19.2	18.9	96	95	66-138	2	30		
Bromodichloromethane	ug/L	<0.50	20	20	18.3	19.3	92	97	75-137	5	30		
Bromoform	ug/L	<4.0	20	20	15.9	17.4	80	87	65-129	9	30		
Bromomethane	ug/L	<4.0	20	20	13.5	14.1	68	71	41-150	4	30	CL	
Carbon disulfide	ug/L	<1.0	20	20	20.7	19.1	101	94	72-132	8	30		
Carbon tetrachloride	ug/L	<0.50	20	20	20.8	19.8	104	99	75-150	5	30		
Chlorobenzene	ug/L	<0.50	20	20	18.6	19.8	93	99	73-127	6	30		
Chloroethane	ug/L	<1.0	20	20	18.2	18.0	91	90	74-138	1	30		
Chloroform	ug/L	<1.0	20	20	18.4	17.8	92	89	74-125	3	30		
Chloromethane	ug/L	<4.0	20	20	17.0	16.2	85	81	58-129	5	30		
cis-1,2-Dichloroethene	ug/L	<0.50	20	20	20.0	19.3	99	96	63-135	4	30		
cis-1,3-Dichloropropene	ug/L	<0.50	20	20	16.2	17.4	81	87	66-129	7	30		
Dibromochloromethane	ug/L	<0.50	20	20	17.8	19.2	89	96	75-133	8	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Parameter	Units	1298789013		2736810		2736811		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<1.0	20	20	16.9	18.6	85	93	68-134	10	30		
Dichlorodifluoromethane	ug/L	<1.0	20	20	24.2	24.1	121	121	72-150	0	30		
Dichlorofluoromethane	ug/L	<1.0	20	20	21.9	21.2	108	104	75-129	4	30		
Diisopropyl ether	ug/L	<1.0	20	20	19.4	18.5	97	92	62-128	5	30		
Ethyl-tert-butyl ether	ug/L	<0.50	20	20	19.9	19.4	100	97	63-132	3	30		
Ethylbenzene	ug/L	<0.50	20	20	19.3	20.5	97	102	72-130	6	30		
Hexachloro-1,3-butadiene	ug/L	<1.0	20	20	24.5	24.0	122	120	71-150	2	30		
Isopropylbenzene (Cumene)	ug/L	<0.50	20	20	18.6	19.4	93	97	70-136	4	30		
m&p-Xylene	ug/L	<1.0	40	40	35.7	37.5	89	94	64-142	5	30		
Methyl-tert-butyl ether	ug/L	<0.50	20	20	18.9	17.9	95	90	72-125	5	30		
Methylene Chloride	ug/L	<4.0	20	20	18.1	17.9	90	90	60-132	1	30		
n-Butylbenzene	ug/L	<0.50	20	20	21.8	21.7	109	108	60-150	1	30		
n-Propylbenzene	ug/L	<0.50	20	20	20.6	21.4	103	107	63-142	4	30		
Naphthalene	ug/L	<1.0	20	20	23.6	23.9	118	120	67-125	1	30		
o-Xylene	ug/L	<0.50	20	20	18.9	20.4	95	102	60-143	8	30		
p-Isopropyltoluene	ug/L	<1.0	20	20	19.1	19.7	96	98	64-146	3	30		
sec-Butylbenzene	ug/L	<0.50	20	20	20.6	20.6	103	103	67-144	0	30		
Styrene	ug/L	<1.0	20	20	17.2	18.0	86	90	67-136	4	30		
tert-Amylmethyl ether	ug/L	<0.50	20	20	19.3	19.5	96	97	60-134	1	30		
tert-Butyl Alcohol	ug/L	<10.0	200	200	205	180	99	87	56-146	13	30		
tert-Butylbenzene	ug/L	<0.50	20	20	20.5	21.3	102	107	68-135	4	30		
Tetrachloroethene	ug/L	<0.50	20	20	19.3	20.1	97	100	67-148	4	30		
Tetrahydrofuran	ug/L	<10.0	200	200	317	336	159	168	51-141	6	30	M1	
Toluene	ug/L	<0.50	20	20	18.0	18.8	88	92	61-140	4	30		
trans-1,2-Dichloroethene	ug/L	<0.50	20	20	20.1	18.9	100	95	62-138	6	30		
trans-1,3-Dichloropropene	ug/L	<0.50	20	20	17.2	18.4	86	92	67-134	7	30		
trans-1,4-Dichloro-2-butene	ug/L	<10.0	50	50	39.6	42.2	79	84	30-150	7	30		
Trichloroethene	ug/L	<0.40	20	20	18.1	18.5	91	93	64-149	2	30		
Trichlorofluoromethane	ug/L	<0.50	20	20	23.3	22.5	117	113	75-150	4	30		
Vinyl acetate	ug/L	<10.0	20	20	19.1	18.5	96	92	49-143	3	30		
Vinyl chloride	ug/L	1.5	20	20	25.7	24.9	121	117	75-133	3	30		
Xylene (Total)	ug/L	<1.5	60	60	54.6	57.9	91	97	63-142	6	30		
1,2-Dichloroethane-d4 (S)	%						107	98	75-137				
4-Bromofluorobenzene (S)	%						107	104	75-125				
Toluene-d8 (S)	%						100	101	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 503304

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

CL The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.

HS Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

P8 Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman WA-Cenex Harvest Lease

Pace Project No.: 10407351

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10407193011	Trip Blank	EPA 8260B	503304		
10407351001	MW1S-GW-101217	EPA 8260B	503304		
10407351002	MW9S-GW-101217	EPA 8260B	503304		
10407351003	MW8S-GW-101217	EPA 8260B	503428		
10407351004	MW10S-GW-101217	EPA 8260B	503304		
10407351005	MW11S-GW-101217	EPA 8260B	503304		
10407351006	MW6U-GW-101217	EPA 8260B	503304		
10407351007	MW6S-GW-101217	EPA 8260B	503304		
10407351008	MW13S-GW-101217	EPA 8260B	503304		
10407351009	MW12S-GW-101217	EPA 8260B	503428		
10407351010	MW9U-GW-101217	EPA 8260B	503428		

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**CHAIN-OF-CUSTODY / Analytical Request Document**  
 The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

~~10407193~~



<b>Section A</b>		<b>Section B</b>		<b>Section C</b>	
<b>Required Client Information:</b>		<b>Required Project Information:</b>		<b>Invoice Information:</b>	
Company: UPRR		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Theriault (atheria@up.com)	
Address: 1400 W. 52nd Ave. Denver, CO 80221		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email: atheria@up.com		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone: _____ Fax: _____		Purchase Order #		Pace Quote: Contract# 758938	
Requested Due Date: 24 Hr / 3 Day / 10 Day		Project Name: Freeman, WA - Cenex Harvest Lease		Pace Project Manager: Jennifer Gross	
		Project #:		Pace Profile #: 36447 / 4	
			Regulatory Agency		
			State / Location		
			WA / Freeman		

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see yield codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						ANALYSES TEST Y/N	Requested Analysis Filtered (Y/N)	Y	10407351					
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other					Low Level VOCs by 8260	6020 Total Iron	6020 Dissolved Iron (Field Filtered)	SM4500P-E Total Phosphorus	
1	MWIS-GW-101217					10/12	14:10			11		X	X	X	X											001
2	MW9S-GW-101217						13:40			10																002
3	MW8S-GW-101217						13:20																			003
4	MW10S-GW-101217						12:15																			004
5	MW11S-GW-101217						11:50																			005
6	MW6V-GW-101217						11:20																			006
7	MW6S-GW-101217						10:55																			007
8	MW13S-GW-101217						10:20																			008
9	MW12S-GW-101217						9:35																			009
10	MW9V-GW-101217						9:00			4																010
11	Trip Blank																									one per cock-011
12																										
ADDITIONAL COMMENTS				RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION			DATE	TIME	SAMPLE CONDITIONS													
*Field filtered by client						10-13-17	15:35	[Signature]			10/14/17	9:15	* Y Y Y													
SAMPLER NAME AND SIGNATURE											TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)											
PRINT Name of SAMPLER:																										
SIGNATURE of SAMPLER:																										
											DATE Signed:															

# 49, 2-7, 4-3, 4-3



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A

Section B

Section C

Required Client Information:

Required Project Information:

Invoice Information:

Company: UPRR	Report To: Mark Ochsner, Brad Ostapkowicz	Attention: Anne Theriault (atheria@up.com)
Address: 1400 W. 52nd Ave. Denver, CO 80221	Copy To: Steve Demus, Lindsey Baumann Copy To: David Hodson, UPRR-Sysdat@ghd.com	Company: UPRR Address: 1400 W. 52nd Ave, Denver, CO 80221
Email: atheria@up.com	Purchase Order #	Pace Quote: Contract# 758938
Phone: <u>                    </u> Fax: <u>                    </u>	Project Name: Freeman, WA - Cenex Harvest Lease	Pace Project Manager: Jennifer Gross
Requested Due Date: <u>24 Hr / 3 Day / 10 Day</u>	Project #:	Pace Profile #: 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID <small>One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique</small>	MATRIX CODE <small>(see valid codes to left)</small>	SAMPLE TYPE <small>(G=GRAB C=COMP)</small>	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N <small>Analyzes Test</small>	Requested Analysis Filtered (Y/N)				
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Y/N	Y			
				DATE	TIME	DATE	TIME														
1	MW1S-GW-101217	WTG		10-12-17	1410			3													
2	MW9S -GW-101217				1340			3													
3	MW8S-GW-101217				1320			3													
4	MW10S-GW-101217				1215			3													
5	MW11S-GW-101217				1150			3													
6	MW6U-GW-101217				1120			3													
7	MW6S-GW-101217				1055			3													
8	MW13S-GW-101217				1020			3													
9	MW12S-GW-101217				0935			3													
10	MW9U-GW-101217				0900			3													
11	Trip Blank				0700			4													
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*Field filtered by client	CH2M	10-13-17	15135				

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: Steve Demus	
SIGNATURE of SAMPLER:	DATE Signed: 10-16-17

TEMP in C Received on ice (Y/N) Chain of Custody Verified (Y/N) Cooler (Y/N) Samples intact (Y/N)

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: UPRR Project #: \_\_\_\_\_

**WO# : 10407193**  
  
 10407351 JG 10/17/17

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 744810328046, 744810328068, 744810328079, 744810328057  
 Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS Temp Blank?  Yes  No  
 Thermometer  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun  
 Used: 5.1, 2.7, 4.3, 4.3 Cooler Temp Read (°C): 5.1, 2.7, 4.3, 4.3 Cooler Temp Corrected (°C): 4.9, 2.7, 4.3, 4.3 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: -0.2 Date and Initials of Person Examining Contents: 10/17/17  
 USDA Regulated Soil  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	Yes	No	N/A	COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		6.
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		8.
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9.
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		12. <u>Wrong analysis on COC</u> <u>WT</u> <u>BC 10-14-17</u>
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # <u>1-10</u> <u>1/1</u> <u>1/1</u> <u>1/1</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	14. <u>See exception sheet</u>
3 Trip Blanks Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):			<u>W/IT</u>	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: Lindsey Baumann Date/Time: 10/17/17

Comments/Resolution: Received revised COCs

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1135</u>	Temp: <u>5.1, 2.7</u>	Corrected Temp: <u>4.9</u>
Time: <u>1155</u>	put in cooler <u>4.3</u>	<u>4.3</u>
Time: _____	Temp: <u>4.1, 4.4</u>	Corrected Temp: _____

Project Manager Review: JENNI GROSS Date: 10/17/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)





Document Name:  
Sample Condition Upon Receipt Form

Document No.:  
F-MN-L-213-rev.21

Document Revised: 30Aug2017  
Page 2 of 2

Issuing Authority:  
Pace Minnesota Quality Office

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
<i>heads pae</i>	<i>MW85-6W-101217</i>	<i>3/3 V69H</i>
<i>heads pae</i>	<i>MW90-6W-101217</i>	<i>2/3 U69H</i>
<i>heads pae</i>	<i>trip blank</i>	<i>4/4 DL911H</i>

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

November 01, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #:MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #:74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Montana Certificate #CERT0103  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification # : 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10407572001	W20-GW-101617	Water	10/16/17 13:20	10/18/17 09:45
10407572002	W26-GW-101617	Water	10/16/17 15:20	10/18/17 09:45
10407572003	MARLOW2-GW-101617	Water	10/16/17 10:55	10/18/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10407572001	W20-GW-101617	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407572002	W26-GW-101617	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10407572003	MARLOW2-GW-101617	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	AR3	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10407572001</b>	<b>W20-GW-101617</b>					
RSK 175	Methane	183	ug/L	10.0	10/19/17 16:43	
6010C Met	Barium, Dissolved	9.8J	ug/L	10.0	10/26/17 17:15	
6010C Met	Calcium, Dissolved	28100	ug/L	500	10/26/17 17:15	
6010C Met	Iron, Dissolved	1130	ug/L	50.0	10/26/17 17:15	
6010C Met	Magnesium, Dissolved	9980	ug/L	500	10/26/17 17:15	
6010C Met	Manganese, Dissolved	43.5	ug/L	5.0	10/26/17 17:15	
6010C Met	Potassium, Dissolved	2060J	ug/L	2500	10/26/17 17:15	
6010C Met	Sodium, Dissolved	9510	ug/L	1000	10/26/17 17:15	
6010C Met	Thallium, Dissolved	7.9J	ug/L	20.0	10/26/17 17:15	B
6010C Met	Vanadium, Dissolved	3.8J	ug/L	15.0	10/26/17 17:15	
6010C Met	Zinc, Dissolved	21.6	ug/L	20.0	10/26/17 17:15	
SM 2320B	Alkalinity, Total as CaCO3	113	mg/L	5.0	10/26/17 10:48	
SM 2540C	Total Dissolved Solids	149	mg/L	10.0	10/23/17 11:23	
SM 4500-S-2 D	Sulfide, Total	3.0	mg/L	0.10	10/23/17 13:46	M1
EPA 300.0	Chloride	8.7	mg/L	1.2	10/18/17 15:40	
EPA 300.0	Nitrate as N	2.0	mg/L	0.10	10/18/17 15:40	
EPA 300.0	Sulfate	5.4	mg/L	1.2	10/18/17 15:40	
EPA 353.2	Nitrogen, NO2 plus NO3	1.7	mg/L	0.020	10/19/17 12:59	
SM 5310C	Total Organic Carbon	0.97J	mg/L	1.0	10/30/17 18:45	
<b>10407572002</b>	<b>W26-GW-101617</b>					
RSK 175	Methane	1.3J	ug/L	10.0	10/19/17 16:50	
6010C Met	Barium, Dissolved	6.1J	ug/L	10.0	10/26/17 17:37	
6010C Met	Calcium, Dissolved	38000	ug/L	500	10/26/17 17:37	
6010C Met	Magnesium, Dissolved	10900	ug/L	500	10/26/17 17:37	
6010C Met	Manganese, Dissolved	0.52J	ug/L	5.0	10/26/17 17:37	
6010C Met	Potassium, Dissolved	2180J	ug/L	2500	10/26/17 17:37	
6010C Met	Sodium, Dissolved	14000	ug/L	1000	10/26/17 17:37	
6010C Met	Thallium, Dissolved	9.6J	ug/L	20.0	10/26/17 17:37	B
6010C Met	Vanadium, Dissolved	6.9J	ug/L	15.0	10/26/17 17:37	
6010C Met	Zinc, Dissolved	107	ug/L	20.0	10/26/17 17:37	
SM 2320B	Alkalinity, Total as CaCO3	160	mg/L	5.0	10/26/17 11:38	
SM 2540C	Total Dissolved Solids	210	mg/L	10.0	10/23/17 11:23	
EPA 300.0	Chloride	3.3	mg/L	1.2	10/18/17 15:25	
EPA 300.0	Nitrate as N	2.1	mg/L	0.10	10/18/17 15:25	
EPA 300.0	Sulfate	6.0	mg/L	1.2	10/18/17 15:25	
EPA 353.2	Nitrogen, NO2 plus NO3	1.9	mg/L	0.040	10/28/17 17:20	
SM 5310C	Total Organic Carbon	0.58J	mg/L	1.0	10/30/17 18:58	
<b>10407572003</b>	<b>MARLOW2-GW-101617</b>					
RSK 175	Methane	1.5J	ug/L	10.0	10/19/17 16:58	
6010C Met	Aluminum, Dissolved	13.2J	ug/L	200	10/26/17 17:40	
6010C Met	Barium, Dissolved	19.1	ug/L	10.0	10/26/17 17:40	
6010C Met	Calcium, Dissolved	62500	ug/L	500	10/26/17 17:40	
6010C Met	Copper, Dissolved	1.6J	ug/L	10.0	10/26/17 17:40	
6010C Met	Iron, Dissolved	2250	ug/L	50.0	10/26/17 17:40	
6010C Met	Magnesium, Dissolved	17300	ug/L	500	10/26/17 17:40	
6010C Met	Manganese, Dissolved	38.4	ug/L	5.0	10/26/17 17:40	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10407572003</b>	<b>MARLOW2-GW-101617</b>					
6010C Met	Potassium, Dissolved	908J	ug/L	2500	10/26/17 17:40	
6010C Met	Sodium, Dissolved	17800	ug/L	1000	10/26/17 17:40	
6010C Met	Thallium, Dissolved	8.0J	ug/L	20.0	10/26/17 17:40	B
6010C Met	Vanadium, Dissolved	3.2J	ug/L	15.0	10/26/17 17:40	
6010C Met	Zinc, Dissolved	33.0	ug/L	20.0	10/26/17 17:40	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	251	mg/L	5.0	10/26/17 11:51	
SM 2540C	Total Dissolved Solids	278	mg/L	10.0	10/23/17 11:23	
EPA 300.0	Chloride	2.0	mg/L	1.2	10/18/17 15:55	
EPA 300.0	Nitrate as N	0.67	mg/L	0.10	10/18/17 15:55	
EPA 300.0	Sulfate	2.9	mg/L	1.2	10/18/17 15:55	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	0.48	mg/L	0.020	10/19/17 13:01	
SM 5310C	Total Organic Carbon	0.75J	mg/L	1.0	10/30/17 19:12	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 503629

B: Analyte was detected in the associated method blank.

- BLANK for HBN 503629 [MPRP/763 (Lab ID: 2738229)]
- Thallium, Dissolved

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 92583

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10407572001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 398002)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 503302

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10407431001,7575446001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2735554)
  - Chloride
  - Sulfate
- MS (Lab ID: 2735556)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2735555)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2735557)
  - Sulfate

**Additional Comments:**

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

### General Information:

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 503957

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10407411001,10407411002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2739914)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2739915)
  - Chemical Oxygen Demand

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** November 01, 2017

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

**Sample: W20-GW-101617**      **Lab ID: 10407572001**      Collected: 10/16/17 13:20      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/19/17 16:43	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/19/17 16:43	74-85-1	
Methane	183	ug/L	10.0	1.1	1		10/19/17 16:43	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/24/17 15:27	10/26/17 17:15	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/24/17 15:27	10/26/17 17:15	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/24/17 15:27	10/26/17 17:15	7440-38-2	
Barium, Dissolved	9.8J	ug/L	10.0	0.22	1	10/24/17 15:27	10/26/17 17:15	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/24/17 15:27	10/26/17 17:15	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/24/17 15:27	10/26/17 17:15	7440-43-9	
Calcium, Dissolved	28100	ug/L	500	24.7	1	10/24/17 15:27	10/26/17 17:15	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/24/17 15:27	10/26/17 17:15	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/24/17 15:27	10/26/17 17:15	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/24/17 15:27	10/26/17 17:15	7440-50-8	
Iron, Dissolved	1130	ug/L	50.0	16.7	1	10/24/17 15:27	10/26/17 17:15	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/24/17 15:27	10/26/17 17:15	7439-92-1	
Magnesium, Dissolved	9980	ug/L	500	2.6	1	10/24/17 15:27	10/26/17 17:15	7439-95-4	
Manganese, Dissolved	43.5	ug/L	5.0	0.38	1	10/24/17 15:27	10/26/17 17:15	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/24/17 15:27	10/26/17 17:15	7440-02-0	
Potassium, Dissolved	2060J	ug/L	2500	126	1	10/24/17 15:27	10/26/17 17:15	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/24/17 15:27	10/26/17 17:15	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/24/17 15:27	10/26/17 17:15	7440-22-4	
Sodium, Dissolved	9510	ug/L	1000	44.6	1	10/24/17 15:27	10/26/17 17:15	7440-23-5	
Thallium, Dissolved	7.9J	ug/L	20.0	4.8	1	10/24/17 15:27	10/26/17 17:15	7440-28-0	B
Vanadium, Dissolved	3.8J	ug/L	15.0	0.42	1	10/24/17 15:27	10/26/17 17:15	7440-62-2	
Zinc, Dissolved	21.6	ug/L	20.0	1.8	1	10/24/17 15:27	10/26/17 17:15	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/24/17 11:27	10/26/17 16:18	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	113	mg/L	5.0	1.4	1		10/26/17 10:48		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	149	mg/L	10.0	5.0	1		10/23/17 11:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	3.0	mg/L	0.10	0.025	5		10/23/17 13:46	18496-25-8	M1
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	8.7	mg/L	1.2	0.14	1		10/18/17 15:40	16887-00-6	
Nitrate as N	2.0	mg/L	0.10	0.0079	1		10/18/17 15:40	14797-55-8	
Sulfate	5.4	mg/L	1.2	0.27	1		10/18/17 15:40	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Sample: W20-GW-101617**      **Lab ID: 10407572001**      Collected: 10/16/17 13:20      Received: 10/18/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.7</b>	mg/L	0.020	0.0075	1		10/19/17 12:59		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/23/17 09:30	10/23/17 13:30		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.97J</b>	mg/L	1.0	0.20	1		10/30/17 18:45	7440-44-0	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

**Sample: W26-GW-101617**      **Lab ID: 10407572002**      Collected: 10/16/17 15:20      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/19/17 16:50	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/19/17 16:50	74-85-1	
Methane	1.3J	ug/L	10.0	1.1	1		10/19/17 16:50	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	10/24/17 15:27	10/26/17 17:37	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/24/17 15:27	10/26/17 17:37	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/24/17 15:27	10/26/17 17:37	7440-38-2	
Barium, Dissolved	6.1J	ug/L	10.0	0.22	1	10/24/17 15:27	10/26/17 17:37	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/24/17 15:27	10/26/17 17:37	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/24/17 15:27	10/26/17 17:37	7440-43-9	
Calcium, Dissolved	38000	ug/L	500	24.7	1	10/24/17 15:27	10/26/17 17:37	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/24/17 15:27	10/26/17 17:37	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/24/17 15:27	10/26/17 17:37	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	10/24/17 15:27	10/26/17 17:37	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	10/24/17 15:27	10/26/17 17:37	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/24/17 15:27	10/26/17 17:37	7439-92-1	
Magnesium, Dissolved	10900	ug/L	500	2.6	1	10/24/17 15:27	10/26/17 17:37	7439-95-4	
Manganese, Dissolved	0.52J	ug/L	5.0	0.38	1	10/24/17 15:27	10/26/17 17:37	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/24/17 15:27	10/26/17 17:37	7440-02-0	
Potassium, Dissolved	2180J	ug/L	2500	126	1	10/24/17 15:27	10/26/17 17:37	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/24/17 15:27	10/26/17 17:37	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/24/17 15:27	10/26/17 17:37	7440-22-4	
Sodium, Dissolved	14000	ug/L	1000	44.6	1	10/24/17 15:27	10/26/17 17:37	7440-23-5	
Thallium, Dissolved	9.6J	ug/L	20.0	4.8	1	10/24/17 15:27	10/26/17 17:37	7440-28-0	B
Vanadium, Dissolved	6.9J	ug/L	15.0	0.42	1	10/24/17 15:27	10/26/17 17:37	7440-62-2	
Zinc, Dissolved	107	ug/L	20.0	1.8	1	10/24/17 15:27	10/26/17 17:37	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/24/17 11:27	10/26/17 16:21	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	160	mg/L	5.0	1.4	1		10/26/17 11:38		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	210	mg/L	10.0	5.0	1		10/23/17 11:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/23/17 13:45	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.3	mg/L	1.2	0.14	1		10/18/17 15:25	16887-00-6	
Nitrate as N	2.1	mg/L	0.10	0.0079	1		10/18/17 15:25	14797-55-8	
Sulfate	6.0	mg/L	1.2	0.27	1		10/18/17 15:25	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Sample: W26-GW-101617**      **Lab ID: 10407572002**      Collected: 10/16/17 15:20      Received: 10/18/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.9</b>	mg/L	0.040	0.015	2		10/28/17 17:20		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/23/17 09:30	10/23/17 13:30		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.58J</b>	mg/L	1.0	0.20	1		10/30/17 18:58	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

**Sample: MARLOW2-GW-101617**      **Lab ID: 10407572003**      Collected: 10/16/17 10:55      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		10/19/17 16:58	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		10/19/17 16:58	74-85-1	
Methane	1.5J	ug/L	10.0	1.1	1		10/19/17 16:58	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	13.2J	ug/L	200	8.6	1	10/24/17 15:27	10/26/17 17:40	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	10/24/17 15:27	10/26/17 17:40	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	10/24/17 15:27	10/26/17 17:40	7440-38-2	
Barium, Dissolved	19.1	ug/L	10.0	0.22	1	10/24/17 15:27	10/26/17 17:40	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	10/24/17 15:27	10/26/17 17:40	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	10/24/17 15:27	10/26/17 17:40	7440-43-9	
Calcium, Dissolved	62500	ug/L	500	24.7	1	10/24/17 15:27	10/26/17 17:40	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	10/24/17 15:27	10/26/17 17:40	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	10/24/17 15:27	10/26/17 17:40	7440-48-4	
Copper, Dissolved	1.6J	ug/L	10.0	0.83	1	10/24/17 15:27	10/26/17 17:40	7440-50-8	
Iron, Dissolved	2250	ug/L	50.0	16.7	1	10/24/17 15:27	10/26/17 17:40	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	10/24/17 15:27	10/26/17 17:40	7439-92-1	
Magnesium, Dissolved	17300	ug/L	500	2.6	1	10/24/17 15:27	10/26/17 17:40	7439-95-4	
Manganese, Dissolved	38.4	ug/L	5.0	0.38	1	10/24/17 15:27	10/26/17 17:40	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	10/24/17 15:27	10/26/17 17:40	7440-02-0	
Potassium, Dissolved	908J	ug/L	2500	126	1	10/24/17 15:27	10/26/17 17:40	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	10/24/17 15:27	10/26/17 17:40	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	10/24/17 15:27	10/26/17 17:40	7440-22-4	
Sodium, Dissolved	17800	ug/L	1000	44.6	1	10/24/17 15:27	10/26/17 17:40	7440-23-5	
Thallium, Dissolved	8.0J	ug/L	20.0	4.8	1	10/24/17 15:27	10/26/17 17:40	7440-28-0	B
Vanadium, Dissolved	3.2J	ug/L	15.0	0.42	1	10/24/17 15:27	10/26/17 17:40	7440-62-2	
Zinc, Dissolved	33.0	ug/L	20.0	1.8	1	10/24/17 15:27	10/26/17 17:40	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	10/24/17 11:27	10/26/17 16:23	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	251	mg/L	5.0	1.4	1		10/26/17 11:51		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	278	mg/L	10.0	5.0	1		10/23/17 11:23		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		10/23/17 13:45	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.0	mg/L	1.2	0.14	1		10/18/17 15:55	16887-00-6	
Nitrate as N	0.67	mg/L	0.10	0.0079	1		10/18/17 15:55	14797-55-8	
Sulfate	2.9	mg/L	1.2	0.27	1		10/18/17 15:55	14808-79-8	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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**Sample: MARLOW2-GW-101617**      **Lab ID: 10407572003**      Collected: 10/16/17 10:55      Received: 10/18/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.48</b>	mg/L	0.020	0.0075	1		10/19/17 13:01		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	10/23/17 09:30	10/23/17 13:31		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.75J</b>	mg/L	1.0	0.20	1		10/30/17 19:12	7440-44-0	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

QC Batch: 503544

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 2737359

Matrix: Water

Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	10/19/17 14:25	
Ethene	ug/L	<0.68	10.0	0.68	10/19/17 14:25	
Methane	ug/L	<1.1	10.0	1.1	10/19/17 14:25	

LABORATORY CONTROL SAMPLE & LCSD: 2737360

2737361

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	104	107	92	94	85-115	3	20	
Ethene	ug/L	106	98.5	100	93	94	85-115	2	20	
Methane	ug/L	60.7	56.3	56.5	93	93	85-115	0	20	

SAMPLE DUPLICATE: 2739445

Parameter	Units	10407496002 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	<1.1		20	

SAMPLE DUPLICATE: 2739446

Parameter	Units	10407496018 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	175	147		20	
Ethene	ug/L	107	88.3		20	
Methane	ug/L	6760	5720		20	

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**QUALITY CONTROL DATA**

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

QC Batch: 503633 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 2738245 Matrix: Water  
 Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	10/26/17 15:35	

LABORATORY CONTROL SAMPLE: 2738246

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2738247 2738248

Parameter	Units	10407654003		2738247		2738248		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury, Dissolved	ug/L	ND	5	5	5	4.9	4.8	98	97	80-120	1	20

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

QC Batch: 503629 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 2738229 Matrix: Water

Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	10/26/17 17:09	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	10/26/17 17:09	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	10/26/17 17:09	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	10/26/17 17:09	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	10/26/17 17:09	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	10/26/17 17:09	
Calcium, Dissolved	ug/L	<24.7	500	24.7	10/26/17 17:09	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	10/26/17 17:09	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	10/26/17 17:09	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	10/26/17 17:09	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	10/26/17 17:09	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	10/26/17 17:09	
Magnesium, Dissolved	ug/L	6.7J	500	2.6	10/26/17 17:09	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	10/26/17 17:09	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	10/26/17 17:09	
Potassium, Dissolved	ug/L	<126	2500	126	10/26/17 17:09	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	10/26/17 17:09	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	10/26/17 17:09	
Sodium, Dissolved	ug/L	129J	1000	44.6	10/26/17 17:09	
Thallium, Dissolved	ug/L	7.9J	20.0	4.8	10/26/17 17:09	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	10/26/17 17:09	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	10/26/17 17:09	

LABORATORY CONTROL SAMPLE: 2738230

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	1020	102	80-120	
Arsenic, Dissolved	ug/L	1000	990	99	80-120	
Barium, Dissolved	ug/L	1000	1010	101	80-120	
Beryllium, Dissolved	ug/L	1000	993	99	80-120	
Cadmium, Dissolved	ug/L	1000	990	99	80-120	
Calcium, Dissolved	ug/L	20000	20500	103	80-120	
Chromium, Dissolved	ug/L	1000	1000	100	80-120	
Cobalt, Dissolved	ug/L	1000	1010	101	80-120	
Copper, Dissolved	ug/L	1000	1010	101	80-120	
Iron, Dissolved	ug/L	20000	20000	100	80-120	
Lead, Dissolved	ug/L	1000	1030	103	80-120	
Magnesium, Dissolved	ug/L	20000	20400	102	80-120	
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

LABORATORY CONTROL SAMPLE: 2738230

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	1010	101	80-120	
Potassium, Dissolved	ug/L	20000	19800	99	80-120	
Selenium, Dissolved	ug/L	1000	1060	106	80-120	
Silver, Dissolved	ug/L	500	505	101	80-120	
Sodium, Dissolved	ug/L	20000	19900	100	80-120	
Thallium, Dissolved	ug/L	1000	879	88	80-120	
Vanadium, Dissolved	ug/L	1000	1010	101	80-120	
Zinc, Dissolved	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2738231 2738232

Parameter	Units	10407572001		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Aluminum, Dissolved	ug/L	<8.6	20000	20000	21100	20300	106	101	75-125	4	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	1030	1020	103	102	75-125	1	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	1030	983	103	98	75-125	4	20	
Barium, Dissolved	ug/L	9.8J	1000	1000	1050	1010	104	100	75-125	4	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	1020	984	102	98	75-125	4	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	1020	974	102	97	75-125	5	20	
Calcium, Dissolved	ug/L	28100	20000	20000	51000	49300	114	106	75-125	3	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	1030	987	103	99	75-125	4	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	1030	987	103	99	75-125	4	20	
Copper, Dissolved	ug/L	<0.83	1000	1000	1040	999	104	100	75-125	4	20	
Iron, Dissolved	ug/L	1130	20000	20000	21600	20900	103	99	75-125	4	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	1060	1010	105	101	75-125	4	20	
Magnesium, Dissolved	ug/L	9980	20000	20000	31500	30300	108	102	75-125	4	20	
Manganese, Dissolved	ug/L	43.5	1000	1000	1080	1040	104	99	75-125	4	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	1030	985	103	98	75-125	4	20	
Potassium, Dissolved	ug/L	2060J	20000	20000	23100	22200	105	101	75-125	4	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1070	1050	107	104	75-125	3	20	
Silver, Dissolved	ug/L	<0.27	500	500	523	500	105	100	75-125	5	20	
Sodium, Dissolved	ug/L	9510	20000	20000	30700	29500	106	100	75-125	4	20	
Thallium, Dissolved	ug/L	7.9J	1000	1000	891	844	88	84	75-125	5	20	
Vanadium, Dissolved	ug/L	3.8J	1000	1000	1050	1000	104	100	75-125	4	20	
Zinc, Dissolved	ug/L	21.6	1000	1000	1070	1030	105	101	75-125	4	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

QC Batch: 504748 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10407572001

METHOD BLANK: 2743709 Matrix: Water  
Associated Lab Samples: 10407572001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	10/26/17 08:25	

LABORATORY CONTROL SAMPLE & LCSD: 2743710 2743711

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	42.4	42.3	106	106	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2743712 2743713

Parameter	Units	10407654008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	145	40	40	184	185	99	102	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2743714 2743715

Parameter	Units	10407909003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	192	40	40	235	237	107	112	80-120	1	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

QC Batch: 504815 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10407572002, 10407572003

METHOD BLANK: 2743886 Matrix: Water

Associated Lab Samples: 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	10/26/17 11:24	

LABORATORY CONTROL SAMPLE & LCSD: 2743887 2743888

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.9	42.3	105	106	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2743889 2743890

Parameter	Units	10407572002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	160	40	40	202	201	105	104	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2743891 2743892

Parameter	Units	10407598004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	46.2	40	40	87.0	87.6	102	104	80-120	1	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

QC Batch: 503975

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 2739951

Matrix: Water

Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	10/23/17 11:23	

LABORATORY CONTROL SAMPLE & LCSD: 2739952

2739965

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1000	956	946	96	95	80-120	1	10	

SAMPLE DUPLICATE: 2739953

Parameter	Units	10407572001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	149	156	5	10	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

QC Batch: 92583 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 397999 Matrix: Water

Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	10/23/17 13:42	

LABORATORY CONTROL SAMPLE: 398000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.20	99	90-110	

MATRIX SPIKE SAMPLE: 398002

Parameter	Units	10407572001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	3.0	1	3.7	69	75-125	M1

SAMPLE DUPLICATE: 398001

Parameter	Units	10407572001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	3.0	3.1	3	20	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

QC Batch: 503302 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 2735552 Matrix: Water  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	10/18/17 14:46	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	10/18/17 14:46	
Sulfate	mg/L	<0.27	1.2	0.27	10/18/17 14:46	

LABORATORY CONTROL SAMPLE: 2735553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	13.0	104	90-110	
Nitrate as N	mg/L	1	1.0	102	90-110	
Sulfate	mg/L	12.5	12.9	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2735554 2735555

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		7575446001 Result	Spike Conc.	Spike Conc.	MS Result						
Chloride	mg/L	8.8	12.5	12.5	19.9	19.8	89	88	90-110	1	20 M1
Nitrate as N	mg/L	ND	1	1	0.95	0.94	91	90	90-110	1	20
Sulfate	mg/L	21.3	12.5	12.5	30.8	30.6	76	75	90-110	1	20 M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2735556 2735557

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10407431001 Result	Spike Conc.	Spike Conc.	MS Result						
Chloride	mg/L	8.1	12.5	12.5	19.2	19.3	89	90	90-110	0	20 M1
Nitrate as N	mg/L	0.080J	1	1	0.99	1.0	91	92	90-110	0	20
Sulfate	mg/L	72.5	12.5	12.5	74.9	75.0	19	20	90-110	0	20 M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

QC Batch: 503436 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10407572001, 10407572003

METHOD BLANK: 2736853 Matrix: Water  
Associated Lab Samples: 10407572001, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/19/17 13:04	FS

LABORATORY CONTROL SAMPLE: 2736854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2736855 2736856

Parameter	Units	10407553001		2736855		2736856		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Nitrogen, NO2 plus NO3	mg/L	0.059	1	1	0.96	0.97	90	92	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2736857 2736858

Parameter	Units	10407553002		2736857		2736858		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Nitrogen, NO2 plus NO3	mg/L	0.35	1	1	1.3	1.2	93	90	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

QC Batch: 505223 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10407572002

METHOD BLANK: 2746322 Matrix: Water  
Associated Lab Samples: 10407572002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	10/28/17 16:05	FS

LABORATORY CONTROL SAMPLE: 2746323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	100	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2746324 2746325

Parameter	Units	10407647001 Result	MS		MSD		% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.92	0.93	90	91	90-110	1	20	FS	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2746326 2746327

Parameter	Units	10407647002 Result	MS		MSD		% Rec	MSD	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.97	0.97	95	95	90-110	0	20		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

QC Batch: 503957 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 2739910 Matrix: Water  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	10/23/17 13:26	

LABORATORY CONTROL SAMPLE: 2739911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	297	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2739912 2739913

Parameter	Units	10407411001		2739912		2739913		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	2120	2500	2500	4510	4600	96	99	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2739914 2739915

Parameter	Units	10407411002		2739914		2739915		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	139000	250000	250000	435000	449000	118	124	90-110	3	20 M1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

QC Batch: 130136 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

METHOD BLANK: 517860 Matrix: Water  
Associated Lab Samples: 10407572001, 10407572002, 10407572003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	10/30/17 17:40	

LABORATORY CONTROL SAMPLE: 517861

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.8	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 517862 517863

Parameter	Units	10407902001 Result	517862		517863		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Total Organic Carbon	mg/L	<1.0	25	25	26.1	26.0	104	104	80-120	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 517864 517865

Parameter	Units	10408139001 Result	517864		517865		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Total Organic Carbon	mg/L	3.6	25	25	29.7	29.7	104	105	80-120	0	20		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407572

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

FS The sample was filtered in the laboratory prior to analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407572

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10407572001	W20-GW-101617	RSK 175	503544		
10407572002	W26-GW-101617	RSK 175	503544		
10407572003	MARLOW2-GW-101617	RSK 175	503544		
10407572001	W20-GW-101617	EPA 3010	503629	6010C Met	504516
10407572002	W26-GW-101617	EPA 3010	503629	6010C Met	504516
10407572003	MARLOW2-GW-101617	EPA 3010	503629	6010C Met	504516
10407572001	W20-GW-101617	EPA 7470A	503633	EPA 7470A	504350
10407572002	W26-GW-101617	EPA 7470A	503633	EPA 7470A	504350
10407572003	MARLOW2-GW-101617	EPA 7470A	503633	EPA 7470A	504350
10407572001	W20-GW-101617	SM 2320B	504748		
10407572002	W26-GW-101617	SM 2320B	504815		
10407572003	MARLOW2-GW-101617	SM 2320B	504815		
10407572001	W20-GW-101617	SM 2540C	503975		
10407572002	W26-GW-101617	SM 2540C	503975		
10407572003	MARLOW2-GW-101617	SM 2540C	503975		
10407572001	W20-GW-101617	SM 4500-S-2 D	92583		
10407572002	W26-GW-101617	SM 4500-S-2 D	92583		
10407572003	MARLOW2-GW-101617	SM 4500-S-2 D	92583		
10407572001	W20-GW-101617	EPA 300.0	503302		
10407572002	W26-GW-101617	EPA 300.0	503302		
10407572003	MARLOW2-GW-101617	EPA 300.0	503302		
10407572001	W20-GW-101617	EPA 353.2	503436		
10407572002	W26-GW-101617	EPA 353.2	505223		
10407572003	MARLOW2-GW-101617	EPA 353.2	503436		
10407572001	W20-GW-101617	EPA 410.4	503957	EPA 410.4	504099
10407572002	W26-GW-101617	EPA 410.4	503957	EPA 410.4	504099
10407572003	MARLOW2-GW-101617	EPA 410.4	503957	EPA 410.4	504099
10407572001	W20-GW-101617	SM 5310C	130136		
10407572002	W26-GW-101617	SM 5310C	130136		
10407572003	MARLOW2-GW-101617	SM 5310C	130136		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10407572

**Section A**

**Required Client Information:**

Company: UPRR  
 Address: 1400 W. 52nd Ave.  
 Denver, CO 80221  
 Email: atheria@up.com  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date: 24 Hr / 3 Day / 10 Day

**Section B**

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order #  
 Project Name: Freeman, WA - Cenex Harvest Lease  
 Project #:

**Section C**

**Invoice Information:**

Attention: Anne Theriault (atheria@up.com)  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447 / 4

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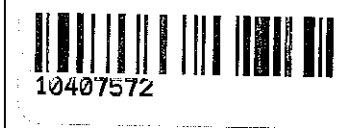
ITEM #	SAMPLE ID <small>One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique</small>	MATRIX <small>Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS</small>	CODE <small>DW WT WW P SL OL WP AR OT TS</small>	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test <small>Lead+Lead+Hg+Cd by 8060 S680-TotAlUrea 8080-Dissolved-Iron-Field-Filterity SIM4500P-E-Total-Phosphorus 2540 TDS 5310 TOC RSK175 MEE 410.4 COD 353.2 NO2+NO3 6010/3470 TAL DISSMETH 2320 NH 3000 Cl,SO4,NITRATE</small>	Requested Analysis: Filtered (Y/N)		Regulatory Agency	State / Location  WA / Freeman						
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Y	N								
						DATE	TIME	DATE	TIME																			
1	WZD-GW-101617	WT G						10/17/13	20	8	4	2	1	1			X	X	X	X	X	X	X	X			C01	
2	WZ6-GW-101617	WT G						10/17/13	20	8	4	2	1	1			X	X	X	X	X	X	X	X	X			C02
3	MARLOWZ-GW-101617	WT G						10/17/13	55	8	4	2	1	1			X	X	X	X	X	X	X	X	X			C03
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*Field filtered by client	CH2K HCU	10/17/13	1600	FED EX Cenex New Pace	10/17/13	1600	2.8 ✓ N ✓

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:					
SIGNATURE of SAMPLER:	DATE Signed:				

Sample Condition Upon Receipt - ESI Tech Specs  
 Client Name: UPRR Project #: **WO# : 10407572**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7448 10327960



Custody Seal on Cooler/Box Present?  Yes  No  
 Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB  
 Thermometer Used:  151401163  687A9155100842  
 Type of Ice:  Wet  Blue  None  
 Temp Blank?  Yes  No  
 Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.0 Cooler Temp Corrected (°C): 2.8 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: -0.2 Date and Initials of Person Examining Contents: ET 10/18/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WAT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-3</u> <u>1/1</u> <u>1/1</u> <u>1/1</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 8.5 pH; H <sub>2</sub> O > 12 Cyanide) Exceptions: VOA, Coliform, FOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Field Data Required?  Yes  No

Temp Log: Temp must be maintained at <6°C during hold. Record Temp every 20 mins

Opened Time: <u>1430</u> Temp: <u>3.0</u>	Corrected Temp: <u>2.8</u>
Time: <u>1430</u> put in cooler	
Time: _____ Temp: _____	Corrected Temp: _____

Project Manager Review: JENNI GROSS Date: 10/18/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)


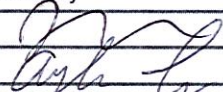

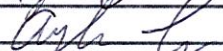


# Chain of Custody

**WO#: 1299191**

PM: HRZ      Due Date: 11/02/17  
 CLIENT: PACE MPLS

Workorder: 10407572      Workorder Name: Freeman, WA-Cenex Harvest Lease      Owner Received Date: 10/18/2017      Results Requested By: 11/1/2017

Report To		Subcontract To						Requested Analysis																		
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																								
								5632354 / 5310 TOC																		
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HS04	Preserved Containers											LAB USE ONLY								
1	W20-GW-101617	PS	10/16/2017 13:20	10407572001	Water	1																				
2	W26-GW-101617	PS	10/16/2017 15:20	10407572002	Water	1																				
3	MARLOW2-GW-101617	PS	10/16/2017 10:55	10407572003	Water	1																				
4																										
5																										
Comments																										
Transfers	Released By	Date/Time	Received By	Date/Time																						
1	 PACE MW	10-18-17 12:00		10/18/17 14:00																						
2		10/18/17 2:30		10/19/17 08:00																						
3																										
Cooler Temperature on Receipt		2.4 °C	Custody Seal		<input checked="" type="checkbox"/> or <input type="checkbox"/> N	Received on Ice		<input checked="" type="checkbox"/> or <input type="checkbox"/> N	Samples Intact <input checked="" type="checkbox"/> or <input type="checkbox"/> N																	

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:  
**Sample Condition Upon Receipt Form**  
 Document No.:  
**F-VM-C-001-Rev.10**

Document Revised: 15Mar2016  
 Page 1 of 1  
 Issuing Authority:  
 Pace Virginia, Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: Pace-MN Project #: \_\_\_\_\_

**WO# : 1299191**  
 PM: HRZ Due Date: 11/02/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: 102 Pace Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.1 Cooler Temp Corrected °C: 2.9 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: J.P. & L.H. 10/19/17

Comments: 10/19/17 dl

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: \_\_\_\_\_

Date: 10-19-17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Chain of Custody

# WO#: 2063766



tical<sup>®</sup>  
abs.com

Workorder: 10407572    Workorder Name: Freeman,WA-Cenex Harvest Lease    Owner Received Date: 10/18/2017    Results Requested By: 11/1/2017

Report To	Subcontract To	Requested Analysis																	
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426	Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																		

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers							5636267 / 4500 Sulfide	LAB USE ONLY		
						Other										
1	W20-GW-101617	PS	10/16/2017 13:20	10407572001	Water	1								X		
2	W26-GW-101617	PS	10/16/2017 15:20	10407572002	Water	1								X		
3	MARLOW2-GW-101617	PS	10/16/2017 10:55	10407572003	Water	1								X		
4																
5																

Transfers						Comments
Released By	Date/Time	Received By	Date/Time			
<i>Justin Freeman / PACE-WA</i>	10-18-17 17:00					
<i>see above</i>	10-19-17	<i>0930</i>		<i>0930</i>		

Cooler Temperature on Receipt *0-7*°C    Custody Seal *(Y)* or N    Received on Ice *(Y)* or N    Samples Intact *(Y)* or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Sample Condition Upon

WO#: 2063766

Pr: PM: CMM CLIENT: PASI-MINN

Due Date: 11/01/17

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  Therm Fisher IR 6  Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10/21/17 [Signature]

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

October 30, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

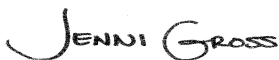
RE: Project: Freeman,WA-Cenex Harvest Lease  
Pace Project No.: 10407574

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #:MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10407574001	W20-GW-101617	Water	10/16/17 13:20	10/18/17 09:45
10407574002	W26-GW-101617	Water	10/16/17 15:20	10/18/17 09:45
10407574003	Marlow2-GW-101617	Water	10/16/17 10:55	10/18/17 09:45
10407574004	Trip Blank	Water	10/16/17 00:00	10/18/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10407574001	W20-GW-101617	EPA 8260B	DJB	83	PASI-M
10407574002	W26-GW-101617	EPA 8260B	DJB	83	PASI-M
10407574003	Marlow2-GW-101617	EPA 8260B	DJB	83	PASI-M
10407574004	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10407574001</b>	<b>W20-GW-101617</b>					
EPA 8260B	1,2,4-Trimethylbenzene	0.70	ug/L	0.50	10/26/17 20:07	
EPA 8260B	1,3,5-Trimethylbenzene	0.22J	ug/L	0.50	10/26/17 20:07	
EPA 8260B	Acetone	31.2	ug/L	20.0	10/26/17 20:07	L1
<b>10407574002</b>	<b>W26-GW-101617</b>					
EPA 8260B	Acetone	12.4J	ug/L	20.0	10/26/17 20:31	L1
EPA 8260B	Carbon tetrachloride	27.0	ug/L	0.50	10/26/17 20:31	
EPA 8260B	Chloroform	1.5	ug/L	1.0	10/26/17 20:31	
<b>10407574003</b>	<b>Marlow2-GW-101617</b>					
EPA 8260B	Acetone	47.5	ug/L	20.0	10/26/17 20:54	L1
EPA 8260B	Carbon tetrachloride	13.0	ug/L	0.50	10/26/17 20:54	
EPA 8260B	tert-Butyl Alcohol	3.1J	ug/L	10.0	10/26/17 20:54	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

**General Information:**

4 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 504814

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2743883)
- Acetone

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 504814

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 1299423001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2743884)
- Acetone
- MSD (Lab ID: 2743885)
- Acetone

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2743884)
- Tetrahydrofuran

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** October 30, 2017

QC Batch: 504814

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 1299423001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2743885)
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Sample: **W20-GW-101617** Lab ID: **10407574001** Collected: 10/16/17 13:20 Received: 10/18/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 20:07	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/26/17 20:07	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/26/17 20:07	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/26/17 20:07	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:07	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:07	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/26/17 20:07	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:07	120-82-1	
1,2,4-Trimethylbenzene	0.70	ug/L	0.50	0.098	1		10/26/17 20:07	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/26/17 20:07	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/26/17 20:07	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/26/17 20:07	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 20:07	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/26/17 20:07	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/26/17 20:07	78-87-5	
1,3,5-Trimethylbenzene	0.22J	ug/L	0.50	0.18	1		10/26/17 20:07	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:07	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/26/17 20:07	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/26/17 20:07	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/26/17 20:07	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/26/17 20:07	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/26/17 20:07	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/26/17 20:07	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/26/17 20:07	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/26/17 20:07	108-10-1	
Acetone	31.2	ug/L	20.0	8.8	1		10/26/17 20:07	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/26/17 20:07	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/26/17 20:07	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:07	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 20:07	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/26/17 20:07	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/26/17 20:07	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/26/17 20:07	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/26/17 20:07	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/26/17 20:07	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/26/17 20:07	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/26/17 20:07	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/26/17 20:07	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

**Sample: W20-GW-101617**      **Lab ID: 10407574001**      Collected: 10/16/17 13:20      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/26/17 20:07	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/26/17 20:07	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 20:07	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/26/17 20:07	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/26/17 20:07	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/26/17 20:07	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/26/17 20:07	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/26/17 20:07	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/26/17 20:07	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:07	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/26/17 20:07	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/26/17 20:07	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/26/17 20:07	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/26/17 20:07	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/26/17 20:07	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/26/17 20:07	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/26/17 20:07	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/26/17 20:07	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/26/17 20:07	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:07	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 20:07	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/26/17 20:07	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:07	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 20:07	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/26/17 20:07	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/26/17 20:07	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/26/17 20:07	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/26/17 20:07	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/26/17 20:07	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/26/17 20:07	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		10/26/17 20:07	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		10/26/17 20:07	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		10/26/17 20:07	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Sample: **W26-GW-101617** Lab ID: **10407574002** Collected: 10/16/17 15:20 Received: 10/18/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 20:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/26/17 20:31	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/26/17 20:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/26/17 20:31	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:31	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:31	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/26/17 20:31	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:31	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/26/17 20:31	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/26/17 20:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/26/17 20:31	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/26/17 20:31	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 20:31	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/26/17 20:31	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/26/17 20:31	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:31	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:31	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/26/17 20:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/26/17 20:31	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/26/17 20:31	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/26/17 20:31	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/26/17 20:31	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/26/17 20:31	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/26/17 20:31	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/26/17 20:31	108-10-1	
Acetone	12.4J	ug/L	20.0	8.8	1		10/26/17 20:31	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/26/17 20:31	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/26/17 20:31	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:31	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 20:31	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/26/17 20:31	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/26/17 20:31	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/26/17 20:31	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/26/17 20:31	75-15-0	
Carbon tetrachloride	27.0	ug/L	0.50	0.20	1		10/26/17 20:31	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/26/17 20:31	75-00-3	
Chloroform	1.5	ug/L	1.0	0.46	1		10/26/17 20:31	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/26/17 20:31	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

**Sample: W26-GW-101617**      **Lab ID: 10407574002**      Collected: 10/16/17 15:20      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/26/17 20:31	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/26/17 20:31	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 20:31	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/26/17 20:31	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/26/17 20:31	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/26/17 20:31	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/26/17 20:31	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/26/17 20:31	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/26/17 20:31	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:31	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/26/17 20:31	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/26/17 20:31	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/26/17 20:31	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/26/17 20:31	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/26/17 20:31	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/26/17 20:31	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/26/17 20:31	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/26/17 20:31	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/26/17 20:31	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:31	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 20:31	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/26/17 20:31	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:31	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 20:31	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/26/17 20:31	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/26/17 20:31	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/26/17 20:31	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/26/17 20:31	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/26/17 20:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/26/17 20:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	110	%	75-137		1		10/26/17 20:31	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/26/17 20:31	2037-26-5	
4-Bromofluorobenzene (S)	105	%	75-125		1		10/26/17 20:31	460-00-4	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

**Sample: Marlow2-GW-101617**      **Lab ID: 10407574003**      Collected: 10/16/17 10:55      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 20:54	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/26/17 20:54	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/26/17 20:54	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/26/17 20:54	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:54	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:54	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/26/17 20:54	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:54	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/26/17 20:54	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/26/17 20:54	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/26/17 20:54	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/26/17 20:54	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 20:54	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/26/17 20:54	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/26/17 20:54	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 20:54	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:54	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/26/17 20:54	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/26/17 20:54	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/26/17 20:54	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/26/17 20:54	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/26/17 20:54	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/26/17 20:54	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/26/17 20:54	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/26/17 20:54	108-10-1	
Acetone	47.5	ug/L	20.0	8.8	1		10/26/17 20:54	67-64-1	L1
Acrolein	<4.8	ug/L	10.0	4.8	1		10/26/17 20:54	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/26/17 20:54	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:54	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 20:54	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/26/17 20:54	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/26/17 20:54	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/26/17 20:54	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/26/17 20:54	75-15-0	
Carbon tetrachloride	13.0	ug/L	0.50	0.20	1		10/26/17 20:54	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/26/17 20:54	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/26/17 20:54	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/26/17 20:54	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	124-48-1	

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

**Sample: Marlow2-GW-101617**      **Lab ID: 10407574003**      Collected: 10/16/17 10:55      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/26/17 20:54	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/26/17 20:54	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 20:54	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/26/17 20:54	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/26/17 20:54	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/26/17 20:54	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/26/17 20:54	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/26/17 20:54	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/26/17 20:54	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/26/17 20:54	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/26/17 20:54	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/26/17 20:54	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/26/17 20:54	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/26/17 20:54	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/26/17 20:54	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/26/17 20:54	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/26/17 20:54	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/26/17 20:54	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/26/17 20:54	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/26/17 20:54	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 20:54	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/26/17 20:54	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/26/17 20:54	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 20:54	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/26/17 20:54	994-05-8	
tert-Butyl Alcohol	3.1J	ug/L	10.0	2.2	1		10/26/17 20:54	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/26/17 20:54	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/26/17 20:54	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/26/17 20:54	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/26/17 20:54	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	109	%	75-137		1		10/26/17 20:54	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		10/26/17 20:54	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		10/26/17 20:54	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

**Sample: Trip Blank**      **Lab ID: 10407574004**      Collected: 10/16/17 00:00      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 16:36	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		10/26/17 16:36	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		10/26/17 16:36	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		10/26/17 16:36	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		10/26/17 16:36	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		10/26/17 16:36	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		10/26/17 16:36	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 16:36	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		10/26/17 16:36	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		10/26/17 16:36	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		10/26/17 16:36	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		10/26/17 16:36	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		10/26/17 16:36	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		10/26/17 16:36	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		10/26/17 16:36	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		10/26/17 16:36	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 16:36	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		10/26/17 16:36	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		10/26/17 16:36	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		10/26/17 16:36	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		10/26/17 16:36	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		10/26/17 16:36	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		10/26/17 16:36	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		10/26/17 16:36	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		10/26/17 16:36	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		10/26/17 16:36	67-64-1	L3
Acrolein	<4.8	ug/L	10.0	4.8	1		10/26/17 16:36	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		10/26/17 16:36	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		10/26/17 16:36	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 16:36	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		10/26/17 16:36	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		10/26/17 16:36	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		10/26/17 16:36	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		10/26/17 16:36	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		10/26/17 16:36	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		10/26/17 16:36	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		10/26/17 16:36	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		10/26/17 16:36	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

**Sample: Trip Blank**      **Lab ID: 10407574004**      Collected: 10/16/17 00:00      Received: 10/18/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		10/26/17 16:36	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		10/26/17 16:36	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		10/26/17 16:36	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		10/26/17 16:36	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		10/26/17 16:36	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	1.0	0.14	1		10/26/17 16:36	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		10/26/17 16:36	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		10/26/17 16:36	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		10/26/17 16:36	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		10/26/17 16:36	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		10/26/17 16:36	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		10/26/17 16:36	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		10/26/17 16:36	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		10/26/17 16:36	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		10/26/17 16:36	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		10/26/17 16:36	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		10/26/17 16:36	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		10/26/17 16:36	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		10/26/17 16:36	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		10/26/17 16:36	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 16:36	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		10/26/17 16:36	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		10/26/17 16:36	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		10/26/17 16:36	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		10/26/17 16:36	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		10/26/17 16:36	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		10/26/17 16:36	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		10/26/17 16:36	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		10/26/17 16:36	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		10/26/17 16:36	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	108	%	75-137		1		10/26/17 16:36	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		10/26/17 16:36	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		10/26/17 16:36	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

QC Batch: 504814

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10407574001, 10407574002, 10407574003, 10407574004

METHOD BLANK: 2743882

Matrix: Water

Associated Lab Samples: 10407574001, 10407574002, 10407574003, 10407574004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	10/26/17 14:15	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	10/26/17 14:15	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	10/26/17 14:15	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	10/26/17 14:15	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	10/26/17 14:15	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	10/26/17 14:15	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	10/26/17 14:15	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	10/26/17 14:15	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	10/26/17 14:15	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	10/26/17 14:15	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	10/26/17 14:15	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	10/26/17 14:15	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	10/26/17 14:15	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	10/26/17 14:15	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	10/26/17 14:15	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	10/26/17 14:15	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	10/26/17 14:15	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	10/26/17 14:15	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	10/26/17 14:15	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	10/26/17 14:15	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	10/26/17 14:15	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	10/26/17 14:15	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	10/26/17 14:15	
2-Hexanone	ug/L	<2.5	5.0	2.5	10/26/17 14:15	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	10/26/17 14:15	
Acetone	ug/L	<8.8	20.0	8.8	10/26/17 14:15	
Acrolein	ug/L	<4.8	10.0	4.8	10/26/17 14:15	
Acrylonitrile	ug/L	<4.9	10.0	4.9	10/26/17 14:15	
Benzene	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
Bromobenzene	ug/L	<0.16	0.50	0.16	10/26/17 14:15	
Bromochloromethane	ug/L	<0.38	1.0	0.38	10/26/17 14:15	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	10/26/17 14:15	
Bromoform	ug/L	<1.0	4.0	1.0	10/26/17 14:15	
Bromomethane	ug/L	<1.5	4.0	1.5	10/26/17 14:15	
Carbon disulfide	ug/L	<0.37	1.0	0.37	10/26/17 14:15	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	10/26/17 14:15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

METHOD BLANK: 2743882

Matrix: Water

Associated Lab Samples: 10407574001, 10407574002, 10407574003, 10407574004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
Chloroethane	ug/L	<0.44	1.0	0.44	10/26/17 14:15	
Chloroform	ug/L	<0.46	1.0	0.46	10/26/17 14:15	
Chloromethane	ug/L	<1.1	4.0	1.1	10/26/17 14:15	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	10/26/17 14:15	
cis-1,3-Dichloropropene	ug/L	<0.12	1.0	0.12	10/26/17 14:15	MN
Dibromochloromethane	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
Dibromomethane	ug/L	<0.50	1.0	0.50	10/26/17 14:15	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	10/26/17 14:15	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	10/26/17 14:15	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	10/26/17 14:15	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
Ethylbenzene	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	10/26/17 14:15	
Isopropylbenzene (Cumene)	ug/L	<0.14	1.0	0.14	10/26/17 14:15	MN
m&p-Xylene	ug/L	<0.24	1.0	0.24	10/26/17 14:15	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
Methylene Chloride	ug/L	<1.2	4.0	1.2	10/26/17 14:15	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	10/26/17 14:15	
Naphthalene	ug/L	<0.42	1.0	0.42	10/26/17 14:15	
o-Xylene	ug/L	<0.11	0.50	0.11	10/26/17 14:15	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	10/26/17 14:15	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	10/26/17 14:15	
Styrene	ug/L	<0.14	1.0	0.14	10/26/17 14:15	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	10/26/17 14:15	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	10/26/17 14:15	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	10/26/17 14:15	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	10/26/17 14:15	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	10/26/17 14:15	
Toluene	ug/L	<0.17	0.50	0.17	10/26/17 14:15	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	10/26/17 14:15	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	10/26/17 14:15	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	10/26/17 14:15	
Trichloroethene	ug/L	<0.18	0.40	0.18	10/26/17 14:15	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	10/26/17 14:15	
Vinyl acetate	ug/L	<1.5	10.0	1.5	10/26/17 14:15	
Vinyl chloride	ug/L	<0.096	0.20	0.096	10/26/17 14:15	
Xylene (Total)	ug/L	<0.24	1.5	0.24	10/26/17 14:15	
1,2-Dichloroethane-d4 (S)	%	103	75-137		10/26/17 14:15	
4-Bromofluorobenzene (S)	%	103	75-125		10/26/17 14:15	
Toluene-d8 (S)	%	100	75-125		10/26/17 14:15	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

LABORATORY CONTROL SAMPLE: 2743883

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.6	98	75-136	
1,1,1-Trichloroethane	ug/L	20	21.1	106	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	20.5	102	71-138	
1,1,2-Trichloroethane	ug/L	20	21.1	106	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.1	105	69-126	
1,1-Dichloroethane	ug/L	20	22.7	114	75-125	
1,1-Dichloroethene	ug/L	20	20.8	104	75-125	
1,1-Dichloropropene	ug/L	20	20.4	102	75-125	
1,2,3-Trichlorobenzene	ug/L	20	17.7	88	75-125	
1,2,3-Trichloropropane	ug/L	20	20.2	101	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.1	96	75-125	
1,2,4-Trimethylbenzene	ug/L	20	20.2	101	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	39.9	80	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	21.0	105	75-125	
1,2-Dichlorobenzene	ug/L	20	19.9	100	75-125	
1,2-Dichloroethane	ug/L	20	20.6	103	70-125	
1,2-Dichloroethene (Total)	ug/L	40	45.6	114	75-125	
1,2-Dichloropropane	ug/L	20	21.3	107	75-125	
1,3,5-Trimethylbenzene	ug/L	20	21.0	105	75-125	
1,3-Dichlorobenzene	ug/L	20	20.2	101	75-125	
1,3-Dichloropropane	ug/L	20	20.8	104	75-125	
1,4-Dichlorobenzene	ug/L	20	20.5	103	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	401	100	64-140	
2,2,4-Trimethylpentane	ug/L	20	24.5	123	68-125	
2,2-Dichloropropane	ug/L	20	23.8	119	70-131	
2-Butanone (MEK)	ug/L	100	99.5	100	69-125	
2-Chlorotoluene	ug/L	20	20.2	101	75-125	
2-Hexanone	ug/L	100	97.2	97	73-129	
4-Chlorotoluene	ug/L	20	21.2	106	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.2	99	73-125	
Acetone	ug/L	100	132	132	66-126	L1
Acrolein	ug/L	200	200	100	56-150	
Acrylonitrile	ug/L	200	216	108	68-129	
Benzene	ug/L	20	21.1	106	75-125	
Bromobenzene	ug/L	20	20.3	102	75-125	
Bromochloromethane	ug/L	20	22.2	111	75-126	
Bromodichloromethane	ug/L	20	20.5	102	75-133	
Bromoform	ug/L	20	16.6	83	62-142	
Bromomethane	ug/L	20	14.6	73	34-143	
Carbon disulfide	ug/L	20	19.5	97	71-125	
Carbon tetrachloride	ug/L	20	20.5	103	71-145	
Chlorobenzene	ug/L	20	20.3	101	75-125	
Chloroethane	ug/L	20	21.1	105	75-125	
Chloroform	ug/L	20	23.1	116	75-125	
Chloromethane	ug/L	20	20.1	101	54-125	
cis-1,2-Dichloroethene	ug/L	20	22.9	115	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.2	101	75-125	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

LABORATORY CONTROL SAMPLE: 2743883

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	17.9	89	74-141	
Dibromomethane	ug/L	20	21.3	107	75-125	
Dichlorodifluoromethane	ug/L	20	20.1	101	59-130	
Dichlorofluoromethane	ug/L	20	21.5	108	75-125	
Diisopropyl ether	ug/L	20	21.6	108	69-125	
Ethyl-tert-butyl ether	ug/L	20	23.1	116	73-125	
Ethylbenzene	ug/L	20	21.0	105	75-125	
Hexachloro-1,3-butadiene	ug/L	20	21.4	107	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.1	95	75-125	
m&p-Xylene	ug/L	40	42.1	105	75-125	
Methyl-tert-butyl ether	ug/L	20	22.8	114	75-125	
Methylene Chloride	ug/L	20	21.6	108	73-125	
n-Butylbenzene	ug/L	20	20.7	103	75-125	
n-Propylbenzene	ug/L	20	20.6	103	75-125	
Naphthalene	ug/L	20	15.4	77	74-125	
o-Xylene	ug/L	20	19.6	98	75-125	
p-Isopropyltoluene	ug/L	20	20.6	103	75-125	
sec-Butylbenzene	ug/L	20	20.7	104	75-125	
Styrene	ug/L	20	19.5	98	75-125	
tert-Amylmethyl ether	ug/L	20	21.3	107	71-126	
tert-Butyl Alcohol	ug/L	200	208	104	69-131	
tert-Butylbenzene	ug/L	20	21.2	106	75-125	
Tetrachloroethene	ug/L	20	19.1	95	75-125	
Tetrahydrofuran	ug/L	200	239	120	65-127	
Toluene	ug/L	20	19.0	95	75-125	
trans-1,2-Dichloroethene	ug/L	20	22.7	114	75-125	
trans-1,3-Dichloropropene	ug/L	20	18.4	92	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	40.6	81	30-150	
Trichloroethene	ug/L	20	20.4	102	75-125	
Trichlorofluoromethane	ug/L	20	20.3	101	71-140	
Vinyl acetate	ug/L	20	21.7	108	68-137	
Vinyl chloride	ug/L	20	22.3	111	70-125	
Xylene (Total)	ug/L	60	61.7	103	75-125	
1,2-Dichloroethane-d4 (S)	%			101	75-137	
4-Bromofluorobenzene (S)	%			99	75-125	
Toluene-d8 (S)	%			100	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2743884 2743885

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		1299423001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	18.3	19.8	92	99	75-137	8	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.0	21.5	110	108	75-139	2	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	18.5	20.3	93	101	60-142	9	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	19.4	20.3	97	102	75-128	5	30	

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2743884		2743885								
Parameter	Units	1299423001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	24.3	26.7	122	134	62-150	9	30	
1,1-Dichloroethane	ug/L	ND	20	20	20.9	22.9	102	113	70-129	9	30	
1,1-Dichloroethene	ug/L	ND	20	20	22.4	23.3	112	117	67-141	4	30	
1,1-Dichloropropene	ug/L	ND	20	20	22.6	21.3	113	107	64-144	6	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	21.3	23.2	107	116	66-139	8	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	19.0	20.3	95	102	69-134	7	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	21.4	22.2	107	111	65-138	4	30	
1,2,4-Trimethylbenzene	ug/L	ND	20	20	19.3	20.9	96	105	65-143	8	30	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	41.4	42.5	83	85	61-134	3	30	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	19.2	20.4	96	102	74-129	6	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	18.8	20.5	94	103	68-135	9	30	
1,2-Dichloroethane	ug/L	ND	20	20	18.8	20.0	94	100	73-125	7	30	
1,2-Dichloroethene (Total)	ug/L	ND	40	40	42.3	45.2	106	113	69-134	7	30	
1,2-Dichloropropane	ug/L	ND	20	20	20.3	21.0	101	105	64-130	3	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.6	22.5	103	113	64-146	9	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	19.5	21.1	97	106	69-135	8	30	
1,3-Dichloropropane	ug/L	ND	20	20	19.1	20.3	96	102	67-128	6	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	19.9	21.4	99	107	66-134	8	30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	367	366	92	92	58-140	0	30	
2,2,4-Trimethylpentane	ug/L	ND	20	20	27.5	27.6	138	138	48-150	0	30	
2,2-Dichloropropane	ug/L	ND	20	20	22.5	24.1	112	120	50-150	7	30	
2-Butanone (MEK)	ug/L	ND	100	100	90.0	91.3	90	91	58-125	1	30	
2-Chlorotoluene	ug/L	ND	20	20	19.6	21.1	98	105	65-138	7	30	
2-Hexanone	ug/L	ND	100	100	91.9	98.3	92	98	61-134	7	30	
4-Chlorotoluene	ug/L	ND	20	20	20.2	21.7	101	108	68-135	7	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	94.1	99.5	94	100	61-130	6	30	
Acetone	ug/L	ND	100	100	165	182	165	182	51-140	10	30	M0
Acrolein	ug/L	ND	200	200	188	188	94	94	48-150	0	30	
Acrylonitrile	ug/L	ND	200	200	184	195	92	97	55-134	6	30	
Benzene	ug/L	ND	20	20	20.3	22.1	101	110	63-132	8	30	
Bromobenzene	ug/L	ND	20	20	19.4	21.0	97	105	67-138	8	30	
Bromochloromethane	ug/L	ND	20	20	19.8	21.3	99	106	66-138	7	30	
Bromodichloromethane	ug/L	ND	20	20	20.6	21.7	103	108	75-137	5	30	
Bromoform	ug/L	ND	20	20	15.9	16.5	80	83	65-129	4	30	
Bromomethane	ug/L	ND	20	20	19.2	19.3	96	96	41-150	0	30	
Carbon disulfide	ug/L	ND	20	20	20.8	21.9	104	110	72-132	5	30	
Carbon tetrachloride	ug/L	ND	20	20	21.1	21.9	106	110	75-150	4	30	
Chlorobenzene	ug/L	ND	20	20	19.4	20.7	97	103	73-127	7	30	
Chloroethane	ug/L	ND	20	20	24.7	24.6	124	123	74-138	0	30	
Chloroform	ug/L	ND	20	20	21.4	22.6	107	113	74-125	6	30	
Chloromethane	ug/L	ND	20	20	21.9	21.1	110	105	58-129	4	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	21.6	22.8	108	114	63-135	5	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	18.5	19.2	93	96	66-129	4	30	
Dibromochloromethane	ug/L	ND	20	20	17.1	17.7	86	89	75-133	3	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2743884		2743885		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		1299423001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	ND	20	20	19.7	21.4	99	107	68-134	8	30		
Dichlorodifluoromethane	ug/L	ND	20	20	25.6	23.9	128	120	72-150	7	30		
Dichlorofluoromethane	ug/L	ND	20	20	24.4	23.2	121	115	75-129	5	30		
Diisopropyl ether	ug/L	ND	20	20	18.8	20.5	94	102	62-128	9	30		
Ethyl-tert-butyl ether	ug/L	ND	20	20	20.7	21.2	104	106	63-132	2	30		
Ethylbenzene	ug/L	ND	20	20	20.2	21.6	101	108	72-130	7	30		
Hexachloro-1,3-butadiene	ug/L	ND	20	20	25.5	25.7	128	128	71-150	1	30		
Isopropylbenzene (Cumene)	ug/L	ND	20	20	18.6	19.9	93	100	70-136	7	30		
m&p-Xylene	ug/L	ND	40	40	40.2	43.4	101	109	64-142	8	30		
Methyl-tert-butyl ether	ug/L	ND	20	20	19.7	21.1	99	105	72-125	7	30		
Methylene Chloride	ug/L	ND	20	20	19.9	21.7	99	109	60-132	9	30		
n-Butylbenzene	ug/L	ND	20	20	22.5	23.2	112	116	60-150	3	30		
n-Propylbenzene	ug/L	ND	20	20	20.5	22.0	102	110	63-142	7	30		
Naphthalene	ug/L	ND	20	20	17.6	19.4	88	97	67-125	10	30		
o-Xylene	ug/L	ND	20	20	18.0	19.6	90	98	60-143	8	30		
p-Isopropyltoluene	ug/L	ND	20	20	20.9	22.1	104	110	64-146	6	30		
sec-Butylbenzene	ug/L	ND	20	20	21.8	22.6	109	113	67-144	4	30		
Styrene	ug/L	ND	20	20	18.3	19.7	91	99	67-136	8	30		
tert-Amylmethyl ether	ug/L	ND	20	20	19.3	20.5	96	103	60-134	6	30		
tert-Butyl Alcohol	ug/L	ND	200	200	189	202	95	101	56-146	7	30		
tert-Butylbenzene	ug/L	ND	20	20	21.7	22.5	109	112	68-135	3	30		
Tetrachloroethene	ug/L	ND	20	20	18.6	20.1	93	100	67-148	8	30		
Tetrahydrofuran	ug/L	ND	200	200	302	293	151	147	51-141	3	30	M1	
Toluene	ug/L	ND	20	20	18.3	19.2	91	96	61-140	5	30		
trans-1,2-Dichloroethene	ug/L	ND	20	20	20.7	22.4	103	112	62-138	8	30		
trans-1,3-Dichloropropene	ug/L	ND	20	20	17.2	18.0	86	90	67-134	5	30		
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	41.1	41.9	82	84	30-150	2	30		
Trichloroethene	ug/L	ND	20	20	19.9	20.9	99	105	64-149	5	30		
Trichlorofluoromethane	ug/L	ND	20	20	25.0	24.4	125	122	75-150	2	30		
Vinyl acetate	ug/L	ND	20	20	19.2	20.4	96	102	49-143	6	30		
Vinyl chloride	ug/L	ND	20	20	26.4	25.4	132	127	75-133	4	30		
Xylene (Total)	ug/L	ND	60	60	58.2	63.0	97	105	63-142	8	30		
1,2-Dichloroethane-d4 (S)	%						99	100	75-137				
4-Bromofluorobenzene (S)	%						101	102	75-125				
Toluene-d8 (S)	%						99	98	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

L1 Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

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### METHOD CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Freeman,WA-Cenex Harvest Lease

Pace Project No.: 10407574

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10407574001	W20-GW-101617	EPA 8260B	504814		
10407574002	W26-GW-101617	EPA 8260B	504814		
10407574003	Marlow2-GW-101617	EPA 8260B	504814		
10407574004	Trip Blank	EPA 8260B	504814		

### REPORT OF LABORATORY ANALYSIS

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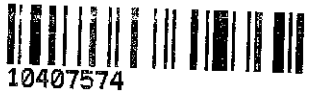


Sample Condition Upon Receipt - ESI Tech Specs

Client Name: WPRR

Project #:

WO#: **10407574**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other:

Tracking Number: 7448 1032 796ce

Optional: Proj. Due Date: Proj. Name:

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PS Temp Blank?  Yes  No

Thermometer Used:  151401163  687A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.0 Cooler Temp Corrected (°C): 2.8 Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C Correction Factor: -0.2 Date and Initials of Person Examining Contents: BT 10/18/17

USDA Regulated Soil ( N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WST</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>SEE EXCEPTIONS</u>
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>2 TRIP BLANKS</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>HA 7107020 EPL 10/18</u>	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1434</u>	Temp: <u>3.0</u>	Corrected Temp: <u>2.8</u>
Time: <u>1430</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review:

JENNI GROSS

Date: 10/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
HEAD SPACE	W20-GW-101617	3/3 V99H > 6 mm
"	W26-GW-101617	1/3 V99H > 6 mm, 1/3 V99H < 6 mm, 1/3 V99H NONE
"	MARLOWZ-GW-101617	2/3 V99H > 6 mm, 1/3 V99H < 6 mm
"	TRIP BLANK	1/2 V99H > 6 mm, 1/2 V99H < 6 mm

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

November 02, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman WA-Grain Handling Faci  
Pace Project No.: 10408156

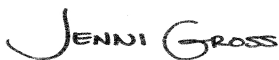
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 20, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman WA-Grain Handling Faci

Pace Project No.: 10408156

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10408156001	SV02-5-091317	Air	10/12/17 15:25	10/20/17 10:10
10408156002	SV03-5-091317	Air	10/12/17 15:16	10/20/17 10:10
10408156003	SV04-5-091317	Air	10/12/17 15:44	10/20/17 10:10
10408156004	SV05-5-091317	Air	10/12/17 16:00	10/20/17 10:10
10408156005	SV06-5-091317	Air	10/12/17 16:09	10/20/17 10:10
10408156006	SV07-5-091317	Air	10/12/17 16:19	10/20/17 10:10
10408156007	SV08-5-091317	Air	10/16/17 16:29	10/20/17 10:10
10408156008	SV10-5-091317	Air	10/16/17 16:50	10/20/17 10:10
10408156009	SV11-5-091317	Air	10/16/17 16:58	10/20/17 10:10
10408156010	SV12-5-091317	Air	10/16/17 17:03	10/20/17 10:10
10408156011	SV13-5-091317	Air	10/16/17 17:09	10/20/17 10:10
10408156012	SV14-5-091317	Air	10/16/17 17:15	10/20/17 10:10
10408156013	SV15-5-091317	Air	10/16/17 17:21	10/20/17 10:10
10408156014	SV16-5-091317	Air	10/16/17 17:29	10/20/17 10:10
10408156015	SV17-5-091317	Air	10/16/17 17:35	10/20/17 10:10
10408156016	SV18-5-091317	Air	10/16/17 17:43	10/20/17 10:10
10408156017	SV19-5-091317	Air	10/16/17 17:50	10/20/17 10:10
10408156018	SV20-5-091317	Air	10/16/17 17:54	10/20/17 10:10
10408156019	SV23-5-091417	Air	10/17/17 08:43	10/20/17 10:10
10408156020	SV24-5-091417	Air	10/17/17 08:51	10/20/17 10:10
10408156021	SV25-5-091417	Air	10/17/17 08:57	10/20/17 10:10
10408156022	SV26-5-091417	Air	10/17/17 09:02	10/20/17 10:10
10408156023	SV27-5-091417	Air	10/17/17 09:03	10/20/17 10:10
10408156024	SV28-5-091417	Air	10/17/17 09:09	10/20/17 10:10
10408156025	SV29-5-091417	Air	10/17/17 09:10	10/20/17 10:10
10408156026	SV30-5-091417	Air	10/17/17 09:15	10/20/17 10:10

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project:  
Pace Project No.:

---

**Method:**  
**Description:**  
**Client:**  
**Date:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## Passive Sorbent Chain of Custody

Case Seal #: 0395533

WO#: 1710406

Company: <u>CH2M/Pace</u>		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:	
Project Manager: <u>David Hodson/CH2M</u>		Project Name: <u>UPRR Freeman</u>				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other ( )	ppbv ug/m3 <input checked="" type="checkbox"/> Normal	Specify
Contact phone/email: <u>510 316-2323</u>		Collected by: <u>Paul Humphreys/CH2M</u>								ppmv mg/m3 <input type="checkbox"/> Rush	
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)				Analysis Requested	Sample Comments:
01A	SV02-5-091317	1725-AN-RTN-049	09/13/17	08:46	10/12/17	15:25		x		Modified TO-17 Passive SE	
02A	SV03-5-091317	1725-AN-RTN-048	09/13/17	08:41	10/12/17	15:16		x		Modified TO-17 Passive SE	
03A	SV04-5-091317	1725-AN-RTN-047	09/13/17	09:01	10/12/17	15:44		x		Modified TO-17 Passive SE	
04A	SV05-5-091317	1725-AN-RTN-046	09/13/17	09:16	10/12/17	16:00		x		Modified TO-17 Passive SE	
05A	SV06-5-091317	1725-AN-RTN-045	09/13/17	09:27	10/12/17	16:09		x		Modified TO-17 Passive SE	
06A	SV07-5-091317	1725-AN-RTN-041	09/13/17	09:33	10/12/17	16:19		x		Modified TO-17 Passive SE	
07A	SV08-5-091317	1725-AN-RTN-042	09/13/17	09:44	10/16/17	16:29		x		Modified TO-17 Passive SE	
08A	SV10-5-091317	1725-AN-RTN-060	09/13/17	10:07	10/16/17	16:50		x		Modified TO-17 Passive SE	
09A	SV11-5-091317	1725-AN-RTN-059	09/13/17	10:17	10/16/17	16:58		x		Modified TO-17 Passive SE	
10A	SV12-5-091317	1725-AN-RTN-058	09/13/17	11:41	10/16/17	17:03		x		Modified TO-17 Passive SE	
11A	SV13-5-091317	1725-AN-RTN-057	09/13/17	13:08	10/16/17	17:09		x		Modified TO-17 Passive SE	
12A	SV14-5-091317	1725-AN-RTN-056	09/13/17	13:19	10/16/17	17:15		x		Modified TO-17 Passive SE	
13A	SV15-5-091317	1725-AN-RTN-055	09/13/17	13:37	10/16/17	17:21		x		Modified TO-17 Passive SE	
Relinquished by:			Date: <u>10-19-17</u>	Time: <u>14:00</u>	Received by: <u>alvep GAR</u>		Date: <u>10/20/17</u>	Time: <u>10:00</u>	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed		
Relinquished by:			Date:	Time:	Received by:		Date:	Time:			
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.											
Lab Use Only											
Shipper Name: <u>FedEx</u>			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None		Blue Ice present or insulated cooler used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
			Sample Condition Upon Receipt: <u>Good</u>								

## Passive Sorbent Chain of Custody

Case Seal #: 0395533

WO#: 1710404

Company: <u>CH2M/Pace</u>		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:		
Project Manager: <u>David Hodson/CH2M</u>		Project Name: <u>UPRR Freeman</u>				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other ( )	ppbv ug/m3 <input checked="" type="checkbox"/> Normal	Specify	
Contact phone/email: <u>510 316-2323</u>		Collected by: <u>Paul Humphreys/CH2M</u>								ppmv mg/m3 <input type="checkbox"/> Rush		
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)					Analysis Requested	Sample Comments:
14A	SV16-5-091317	1725-AN-RTN-054	09/13/17	13:47	10/16/17	17:29		x			Modified TO-17 Passive SE	
15A	SV17-5-091317	1725-AN-RTN-044	09/13/17	13:56	10/16/17	17:35		x			Modified TO-17 Passive SE	
16A	SV18-5-091317	1725-AN-RTN-053	09/13/17	14:24	10/16/17	17:43		x			Modified TO-17 Passive SE	
17A	SV19-5-091317	1725-AN-RTN-052	09/13/17	14:36	10/16/17	17:50		x			Modified TO-17 Passive SE	
18A	SV20-5-091317	1725-AN-RTN-051	09/13/17	14:57	10/16/17	17:54		x			Modified TO-17 Passive SE	
19A	SV23-5-091417	1725-AN-RTN-068	09/14/17	07:45	10/17/17	08:43		x			Modified TO-17 Passive SE	
20A	SV24-5-091417	1725-AN-RTN-067	09/14/17	08:04	10/17/17	08:51		x			Modified TO-17 Passive SE	
21A	SV25-5-091417	1725-AN-RTN-066	09/14/17	08:21	10/17/17	08:57		x			Modified TO-17 Passive SE	
22A	SV26-5-091417	1725-AN-RTN-065	09/14/17	08:35	10/17/17	09:02		x			Modified TO-17 Passive SE	
23A	SV27-5-091417	1725-AN-RTN-064	09/14/17	08:43	10/17/17	09:03		x			Modified TO-17 Passive SE	
24A	SV28-5-091417	1725-AN-RTN-063	09/14/17	08:51	10/17/17	09:09		x			Modified TO-17 Passive SE	
25A	SV29-5-091417	1725-AN-RTN-062	09/14/17	09:03	10/17/17	09:10		x			Modified TO-17 Passive SE	
26A	SV30-5-091417	1725-AN-RTN-061	09/14/17	09:14	10/17/17	09:15		x			Modified TO-17 Passive SE	
Relinquished by:			Date: <u>10-19-17</u>	Time: <u>14:00</u>	Received by: <u>albert GATL</u>		Date: <u>10/20/17</u>	Time: <u>1010</u>	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed			
Relinquished by:			Date:	Time:	Received by:		Date:	Time:				
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.												
Lab Use Only												
Shipper Name: <u>Red Gx</u>			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None		Blue Ice present or insulated cooler used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
Sample Condition Upon Receipt: <u>Good</u>												

11/2/2017  
Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane WA 99201

Project Name: UPRR Freeman  
Project #:  
Workorder #: 1710406

Dear Mr. Steve Demus

The following report includes the data for the above referenced project for sample(s) received on 10/20/2017 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**WORK ORDER #: 1710406**

Work Order Summary

<b>CLIENT:</b>	Mr. Steve Demus CH2M Hill 999 W. Riverside Ave Suite 500 Spokane, WA 99201	<b>BILL TO:</b>	Ms. Ashley Bonin Pace Analytical Services 1700 Elm St. Minneapolis, MN 55414
<b>PHONE:</b>	509.464.7222	<b>P.O. #</b>	
<b>FAX:</b>		<b>PROJECT #</b>	UPRR Freeman
<b>DATE RECEIVED:</b>	10/20/2017	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	11/02/2017		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	SV02-5-091317	Passive S.E. WMS
02A	SV03-5-091317	Passive S.E. WMS
03A	SV04-5-091317	Passive S.E. WMS
04A	SV05-5-091317	Passive S.E. WMS
05A	SV06-5-091317	Passive S.E. WMS
06A	SV07-5-091317	Passive S.E. WMS
07A	SV08-5-091317	Passive S.E. WMS
08A	SV10-5-091317	Passive S.E. WMS
09A	SV11-5-091317	Passive S.E. WMS
10A	SV12-5-091317	Passive S.E. WMS
11A	SV13-5-091317	Passive S.E. WMS
12A	SV14-5-091317	Passive S.E. WMS
13A	SV15-5-091317	Passive S.E. WMS
14A	SV16-5-091317	Passive S.E. WMS
15A	SV17-5-091317	Passive S.E. WMS
16A	SV18-5-091317	Passive S.E. WMS
17A	SV19-5-091317	Passive S.E. WMS
18A	SV20-5-091317	Passive S.E. WMS
19A	SV23-5-091417	Passive S.E. WMS
20A	SV24-5-091417	Passive S.E. WMS
21A	SV25-5-091417	Passive S.E. WMS
22A	SV26-5-091417	Passive S.E. WMS
23A	SV27-5-091417	Passive S.E. WMS

Continued on next page

**WORK ORDER #: 1710406**

## Work Order Summary

**CLIENT:** Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane, WA 99201

**PHONE:** 509.464.7222

**FAX:**

**DATE RECEIVED:** 10/20/2017

**DATE COMPLETED:** 11/02/2017

**BILL TO:** Ms. Ashley Bonin  
Pace Analytical Services  
1700 Elm St.  
Minneapolis, MN 55414

**P.O. #**

**PROJECT #** UPRR Freeman

**CONTACT:** Kelly Buettner

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
24A	SV28-5-091417	Passive S.E. WMS
25A	SV29-5-091417	Passive S.E. WMS
26A	SV30-5-091417	Passive S.E. WMS
27A	Lab Blank	Passive S.E. WMS
27B	Lab Blank	Passive S.E. WMS
28A	LCS	Passive S.E. WMS
28AA	LCSD	Passive S.E. WMS
28B	LCS	Passive S.E. WMS
28BB	LCSD	Passive S.E. WMS

CERTIFIED BY:



Technical Director

DATE: 11/02/17

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**WMS Passive SE by Mod EPA TO-17**  
**CH2M Hill**  
**Workorder# 1710406**

Twenty-six WMS-TM samples were received on October 20, 2017. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

To calculate ug/m3 concentrations in the Lab Blanks, a sampling duration of 47925 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field



---

temperatures were provided, the rate was adjusted in the same manner as the field samples.

### **Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV02-5-091317**

**Lab ID#: 1710406-01A**

No Detections Were Found.

**Client Sample ID: SV03-5-091317**

**Lab ID#: 1710406-02A**

No Detections Were Found.

**Client Sample ID: SV04-5-091317**

**Lab ID#: 1710406-03A**

No Detections Were Found.

**Client Sample ID: SV05-5-091317**

**Lab ID#: 1710406-04A**

No Detections Were Found.

**Client Sample ID: SV06-5-091317**

**Lab ID#: 1710406-05A**

No Detections Were Found.

**Client Sample ID: SV07-5-091317**

**Lab ID#: 1710406-06A**

No Detections Were Found.

**Client Sample ID: SV08-5-091317**

**Lab ID#: 1710406-07A**

No Detections Were Found.

**Client Sample ID: SV10-5-091317**

**Lab ID#: 1710406-08A**

No Detections Were Found.

**Client Sample ID: SV11-5-091317**

**Lab ID#: 1710406-09A**

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV11-5-091317**

**Lab ID#: 1710406-09A**

No Detections Were Found.

**Client Sample ID: SV12-5-091317**

**Lab ID#: 1710406-10A**

No Detections Were Found.

**Client Sample ID: SV13-5-091317**

**Lab ID#: 1710406-11A**

No Detections Were Found.

**Client Sample ID: SV14-5-091317**

**Lab ID#: 1710406-12A**

No Detections Were Found.

**Client Sample ID: SV15-5-091317**

**Lab ID#: 1710406-13A**

No Detections Were Found.

**Client Sample ID: SV16-5-091317**

**Lab ID#: 1710406-14A**

No Detections Were Found.

**Client Sample ID: SV17-5-091317**

**Lab ID#: 1710406-15A**

No Detections Were Found.

**Client Sample ID: SV18-5-091317**

**Lab ID#: 1710406-16A**

No Detections Were Found.

**Client Sample ID: SV19-5-091317**

**Lab ID#: 1710406-17A**

## Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV19-5-091317**

**Lab ID#: 1710406-17A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	1.3	160

**Client Sample ID: SV20-5-091317**

**Lab ID#: 1710406-18A**

No Detections Were Found.

**Client Sample ID: SV23-5-091417**

**Lab ID#: 1710406-19A**

No Detections Were Found.

**Client Sample ID: SV24-5-091417**

**Lab ID#: 1710406-20A**

No Detections Were Found.

**Client Sample ID: SV25-5-091417**

**Lab ID#: 1710406-21A**

No Detections Were Found.

**Client Sample ID: SV26-5-091417**

**Lab ID#: 1710406-22A**

No Detections Were Found.

**Client Sample ID: SV27-5-091417**

**Lab ID#: 1710406-23A**

No Detections Were Found.

**Client Sample ID: SV28-5-091417**

**Lab ID#: 1710406-24A**

No Detections Were Found.

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV29-5-091417**

**Lab ID#: 1710406-25A**

No Detections Were Found.

**Client Sample ID: SV30-5-091417**

**Lab ID#: 1710406-26A**

No Detections Were Found.



Air Toxics

Client Sample ID: SV02-5-091317

Lab ID#: 1710406-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102615sim	Date of Collection:	10/12/17 3:25:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 02:00 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.6	Not Detected	Not Detected

Temperature = 77.0F , duration time = 42159 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV03-5-091317

Lab ID#: 1710406-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102616sim	Date of Collection:	10/12/17 3:16:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 02:26 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.6	Not Detected	Not Detected

Temperature = 77.0F , duration time = 42155 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV04-5-091317

Lab ID#: 1710406-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102617sim	Date of Collection:	10/12/17 3:44:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 02:51 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.6	Not Detected	Not Detected

Temperature = 77.0F , duration time = 42163 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Client Sample ID: SV05-5-091317

Lab ID#: 1710406-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102618sim	Date of Collection:	10/12/17 4:00:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 03:16 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.6	Not Detected	Not Detected

Temperature = 77.0F , duration time = 42164 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV06-5-091317

Lab ID#: 1710406-05A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102619sim	Date of Collection:	10/12/17 4:09:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 03:42 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.6	Not Detected	Not Detected

Temperature = 77.0F , duration time = 42162 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV07-5-091317

Lab ID#: 1710406-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102620sim	Date of Collection:	10/12/17 4:19:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 04:07 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.6	Not Detected	Not Detected

Temperature = 77.0F , duration time = 42166 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130



Air Toxics

Client Sample ID: SV08-5-091317

Lab ID#: 1710406-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102621sim	Date of Collection:	10/16/17 4:29:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 04:32 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47925 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130



Air Toxics

Client Sample ID: SV10-5-091317

Lab ID#: 1710406-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102622sim	Date of Collection:	10/16/17 4:50:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 04:57 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47923 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV11-5-091317

Lab ID#: 1710406-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102623sim	Date of Collection:	10/16/17 4:58:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 05:23 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47921 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV12-5-091317

Lab ID#: 1710406-10A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102624sim	Date of Collection:	10/16/17 5:03:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 05:48 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47842 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV13-5-091317

Lab ID#: 1710406-11A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102625sim	Date of Collection:	10/16/17 5:09:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 06:13 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47761 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Client Sample ID: SV14-5-091317

Lab ID#: 1710406-12A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102626sim	Date of Collection:	10/16/17 5:15:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 06:38 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47756 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV15-5-091317

Lab ID#: 1710406-13A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102627sim	Date of Collection:	10/16/17 5:21:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 07:03 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47744 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130



Air Toxics

Client Sample ID: SV16-5-091317

Lab ID#: 1710406-14A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102628sim	Date of Collection:	10/16/17 5:29:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 07:28 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47742 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV17-5-091317

Lab ID#: 1710406-15A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102629sim	Date of Collection:	10/16/17 5:35:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 07:52 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47739 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV18-5-091317

Lab ID#: 1710406-16A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102630sim	Date of Collection:	10/16/17 5:43:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 08:17 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47719 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV19-5-091317

Lab ID#: 1710406-17A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102631sim	Date of Collection:	10/16/17 5:50:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 08:42 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	1.3	160

Temperature = 77.0F , duration time = 47714 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV20-5-091317

Lab ID#: 1710406-18A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102632sim	Date of Collection:	10/16/17 5:54:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/26/17 09:07 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47697 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV23-5-091417

Lab ID#: 1710406-19A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102306sim	Date of Collection:	10/17/17 8:43:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 11:55 AM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47578 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130





Air Toxics

Client Sample ID: SV24-5-091417

Lab ID#: 1710406-20A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102307sim	Date of Collection:	10/17/17 8:51:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 12:20 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47567 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: SV25-5-091417

Lab ID#: 1710406-21A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102308sim	Date of Collection:	10/17/17 8:57:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 12:46 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47556 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV26-5-091417

Lab ID#: 1710406-22A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102309sim	Date of Collection:	10/17/17 9:02:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 01:11 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47547 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV27-5-091417

Lab ID#: 1710406-23A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102310sim	Date of Collection:	10/17/17 9:03:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 01:37 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47540 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: SV28-5-091417

Lab ID#: 1710406-24A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102311sim	Date of Collection:	10/17/17 9:09:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 02:02 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47538 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



Air Toxics

Client Sample ID: SV29-5-091417

Lab ID#: 1710406-25A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102312sim	Date of Collection:	10/17/17 9:10:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 02:28 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47527 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV30-5-091417

Lab ID#: 1710406-26A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102313sim	Date of Collection:	10/17/17 9:15:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 02:53 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47521 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

Client Sample ID: Lab Blank

Lab ID#: 1710406-27A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102305sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/23/17 11:29 AM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47925 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



Client Sample ID: Lab Blank

Lab ID#: 1710406-27B

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102614sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/26/17 01:35 PM
		Date of Extraction:	10/26/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47925 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130

Client Sample ID: LCS

Lab ID#: 1710406-28A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102303sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/23/17 10:38 AM
		Date of Extraction: 10/23/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	96	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130

Client Sample ID: LCSD

Lab ID#: 1710406-28AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102304sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/23/17 11:04 AM
		Date of Extraction:	10/23/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

Client Sample ID: LCS

Lab ID#: 1710406-28B

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102612sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/26/17 12:45 PM
		Date of Extraction:	10/26/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	94	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130

Client Sample ID: LCSD

Lab ID#: 1710406-28BB

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c102613sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/26/17 01:10 PM
		Date of Extraction: 10/26/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	105	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130

November 02, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman WA-Grain Handling Faci  
Pace Project No.: 10408159

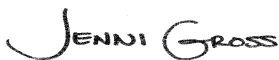
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 20, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman WA-Grain Handling Faci

Pace Project No.: 10408159

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10408159001	SV31-5-091417	Air	10/17/17 09:16	10/20/17 10:10
10408159002	SV32-5-091417	Air	10/17/17 09:24	10/20/17 10:10
10408159003	SV33-3-091417	Air	10/17/17 09:26	10/20/17 10:10
10408159004	SV34-5-091417	Air	10/17/17 09:31	10/20/17 10:10
10408159005	SV35-5-091417	Air	10/17/17 09:36	10/20/17 10:10
10408159006	SV36-5-091417	Air	10/17/17 09:48	10/20/17 10:10
10408159007	SV37-5-091417	Air	10/17/17 09:50	10/20/17 10:10
10408159008	SV38-5-091417	Air	10/17/17 10:00	10/20/17 10:10
10408159009	SV39-5-091417	Air	10/17/17 10:01	10/20/17 10:10

## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

## PROJECT NARRATIVE

Project:  
Pace Project No.:

---

**Method:**  
**Description:**  
**Client:**  
**Date:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS


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**Passive Sorbent Chain of Custody**

Case Seal #: 0395533

WO#: 1710405

Company: <u>CH2M/Pace</u>		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:		
Project Manager: <u>David Hodson/CH2M</u>		Project Name: <u>UPRR Freeman</u>				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other ( )	<input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Specify _____		
Contact phone/email: <u>510 316-2323</u>		Collected by: <u>Paul Humphreys/CH2M</u>								ppbv ug/m3 ppmv mg/m3 ug ng		Analysis Requested
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)						
01A	SV31-5-091417	1725-AN-RTN-080	09/14/17	09:27	10/17/17	09:16		x			Modified TO-17 Passive SE	
02A	SV32-5-091417	1725-AN-RTN-079	09/14/17	09:38	10/17/17	09:24		x			Modified TO-17 Passive SE	
03A	SV33-3-091417	1725-AN-RTN-078	09/14/17	10:08	10/17/17	09:26		x			Modified TO-17 Passive SE	
04A	SV34-5-091417	1725-AN-RTN-077	09/14/17	10:19	10/17/17	09:31		x			Modified TO-17 Passive SE	
05A	SV35-5-091417	1725-AN-RTN-076	09/14/17	10:35	10/17/17	09:36		x			Modified TO-17 Passive SE	
06A	SV36-5-091417	1725-AN-RTN-075	09/14/17	10:45	10/17/17	09:48		x			Modified TO-17 Passive SE	
07A	SV37-5-091417	1725-AN-RTN-074	09/14/17	10:58	10/17/17	09:50		x			Modified TO-17 Passive SE	
08A	SV38-5-091417	1725-AN-RTN-073	09/14/17	11:08	10/17/17	10:00		x			Modified TO-17 Passive SE	
09A	SV39-5-091417	1725-AN-RTN-072	09/14/17	11:39	10/17/17	10:01		x			Modified TO-17 Passive SE	
Relinquished by: 			Date: <u>10-19-17</u>	Time: <u>14:00</u>	Received by: <u>alvina GATE</u>		Date: <u>10/20/17</u>	Time: <u>1010</u>	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed			
Relinquished by: _____			Date: _____	Time: _____	Received by: _____		Date: _____	Time: _____				
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.												
Lab Use Only												
Shipper Name: <u>FedEx</u>			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None		Blue Ice present or insulated cooler used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
			Sample Condition Upon Receipt: <u>Good</u>									

11/2/2017  
Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane WA 99201

Project Name: UPRR Freeman  
Project #:  
Workorder #: 1710405

Dear Mr. Steve Demus

The following report includes the data for the above referenced project for sample(s) received on 10/20/2017 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**WORK ORDER #: 1710405**

## Work Order Summary

**CLIENT:** Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane, WA 99201

**PHONE:** 509.464.7222

**FAX:**

**DATE RECEIVED:** 10/20/2017

**DATE COMPLETED:** 11/02/2017

**BILL TO:** Ms. Ashley Bonin  
Pace Analytical Services  
1700 Elm St.  
Minneapolis, MN 55414

**P.O. #**

**PROJECT #** UPRR Freeman

**CONTACT:** Kelly Buettner

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	SV31-5-091417	Passive S.E. WMS
02A	SV32-5-091417	Passive S.E. WMS
03A	SV33-3-091417	Passive S.E. WMS
04A	SV34-5-091417	Passive S.E. WMS
05A	SV35-5-091417	Passive S.E. WMS
06A	SV36-5-091417	Passive S.E. WMS
07A	SV37-5-091417	Passive S.E. WMS
08A	SV38-5-091417	Passive S.E. WMS
09A	SV39-5-091417	Passive S.E. WMS
10A	Lab Blank	Passive S.E. WMS
11A	LCS	Passive S.E. WMS
11AA	LCSD	Passive S.E. WMS

CERTIFIED BY:



Technical Director

DATE: 11/02/17

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**WMS Passive SE by Mod EPA TO-17**  
**CH2M Hill**  
**Workorder# 1710405**

Nine WMS-TM samples were received on October 20, 2017. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

To calculate ug/m<sup>3</sup> concentrations in the Lab Blank, a sampling duration of 47509 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field

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temperatures were provided, the rate was adjusted in the same manner as the field samples.

### **Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

## Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV31-5-091417**

**Lab ID#: 1710405-01A**

No Detections Were Found.

**Client Sample ID: SV32-5-091417**

**Lab ID#: 1710405-02A**

No Detections Were Found.

**Client Sample ID: SV33-3-091417**

**Lab ID#: 1710405-03A**

No Detections Were Found.

**Client Sample ID: SV34-5-091417**

**Lab ID#: 1710405-04A**

No Detections Were Found.

**Client Sample ID: SV35-5-091417**

**Lab ID#: 1710405-05A**

No Detections Were Found.

**Client Sample ID: SV36-5-091417**

**Lab ID#: 1710405-06A**

No Detections Were Found.

**Client Sample ID: SV37-5-091417**

**Lab ID#: 1710405-07A**

No Detections Were Found.

**Client Sample ID: SV38-5-091417**

**Lab ID#: 1710405-08A**

No Detections Were Found.

**Client Sample ID: SV39-5-091417**

**Lab ID#: 1710405-09A**

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV39-5-091417**

**Lab ID#: 1710405-09A**

No Detections Were Found.



Air Toxics

Client Sample ID: SV31-5-091417

Lab ID#: 1710405-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103006sim	Date of Collection:	10/17/17 9:16:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:25 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47509 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130





Air Toxics

Client Sample ID: SV32-5-091417

Lab ID#: 1710405-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103007sim	Date of Collection:	10/17/17 9:24:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:50 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47506 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV33-3-091417

Lab ID#: 1710405-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103008sim	Date of Collection:	10/17/17 9:26:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 02:15 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47478 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV34-5-091417

Lab ID#: 1710405-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103009sim	Date of Collection:	10/17/17 9:31:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 02:40 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47472 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130



Air Toxics

Client Sample ID: SV35-5-091417

Lab ID#: 1710405-05A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103010sim	Date of Collection:	10/17/17 9:36:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 03:05 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47461 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130

Client Sample ID: SV36-5-091417

Lab ID#: 1710405-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103011sim	Date of Collection:	10/17/17 9:48:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 03:30 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47463 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV37-5-091417

Lab ID#: 1710405-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103012sim	Date of Collection:	10/17/17 9:50:00 AM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 03:55 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47452 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



Air Toxics

Client Sample ID: SV38-5-091417

Lab ID#: 1710405-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103013sim	Date of Collection:	10/17/17 10:00:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 04:20 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47452 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV39-5-091417

Lab ID#: 1710405-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103014sim	Date of Collection:	10/17/17 10:01:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 04:44 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47422 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130





Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1710405-10A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103005sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:00 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47509 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130

Client Sample ID: LCS

Lab ID#: 1710405-11A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103003sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/30/17 12:11 PM
		Date of Extraction: 10/30/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

Client Sample ID: LCSD

Lab ID#: 1710405-11AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103004sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/17 12:35 PM
		Date of Extraction:	10/30/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	111	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

November 02, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman WA-Grain Handling Faci  
Pace Project No.: 10408162

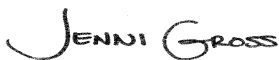
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 20, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman WA-Grain Handling Faci

Pace Project No.: 10408162

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10408162001	SV80-5-091517	Air	10/17/17 15:38	10/20/17 10:10
10408162002	SV81-5-091517	Air	10/17/17 15:39	10/20/17 10:10
10408162003	SV82-5-091517	Air	10/17/17 15:49	10/20/17 10:10
10408162004	SV83-5-091517	Air	10/17/17 15:53	10/20/17 10:10
10408162005	SV84-5-091517	Air	10/17/17 16:04	10/20/17 10:10
10408162006	SV85-5-091517	Air	10/17/17 16:13	10/20/17 10:10
10408162007	SV86-5-091517	Air	10/17/17 16:17	10/20/17 10:10
10408162008	SV87-5-091517	Air	10/17/17 16:19	10/20/17 10:10
10408162009	SV88-5-091517	Air	10/17/17 16:32	10/20/17 10:10
10408162010	SV89-5-091517	Air	10/17/17 16:34	10/20/17 10:10
10408162011	SV90-5-091517	Air	10/17/17 16:46	10/20/17 10:10
10408162012	SV92-4-091517	Air	10/17/17 16:56	10/20/17 10:10

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## PROJECT NARRATIVE

Project:  
Pace Project No.:

---

**Method:**  
**Description:**  
**Client:**  
**Date:**

This data package has been reviewed for quality and completeness and is approved for release.


## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

**Passive Sorbent Chain of Custody**

Case Seal #: 0395537

WO#: 1710403

Company: <u>CH2M/Pace</u>		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:	
Project Manager: <u>David Hodson/CH2M</u>		Project Name: <u>UPRR Freeman</u>				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other ( )	ppbv ug/m3 <input checked="" type="checkbox"/> Normal	Specify _____
Contact phone/email: <u>510 316-2323</u>		Collected by: <u>Paul Humphreys/CH2M</u>								ppmv mg/m3 <input type="checkbox"/> Rush	
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)				Analysis Requested	Sample Comments:
<u>01A</u>	<u>SV80-5-091517</u>	<u>1725-AN-RTN-091</u>	<u>09/15/17</u>	<u>11:40</u>	<u>10/17/17</u>	<u>15:38</u>		x		Modified TO-17 Passive SE	
<u>02A</u>	<u>SV81-5-091517</u>	<u>1725-AN-RTN-009</u>	<u>09/15/17</u>	<u>11:58</u>	<u>10/17/17</u>	<u>15:39</u>		x		Modified TO-17 Passive SE	
<u>03A</u>	<u>SV82-5-091517</u>	<u>1725-AN-RTN-008</u>	<u>09/15/17</u>	<u>12:39</u>	<u>10/17/17</u>	<u>15:49</u>		x		Modified TO-17 Passive SE	
<u>04A</u>	<u>SV83-5-091517</u>	<u>1725-AN-RTN-007</u>	<u>09/15/17</u>	<u>12:44</u>	<u>10/17/17</u>	<u>15:53</u>		x		Modified TO-17 Passive SE	
<u>05A</u>	<u>SV84-5-091517</u>	<u>1725-AN-RTN-006</u>	<u>09/15/17</u>	<u>12:53</u>	<u>10/17/17</u>	<u>16:04</u>		x		Modified TO-17 Passive SE	
<u>06A</u>	<u>SV85-5-091517</u>	<u>1725-AN-RTN-005</u>	<u>09/15/17</u>	<u>13:05</u>	<u>10/17/17</u>	<u>16:13</u>		x		Modified TO-17 Passive SE	
<u>07A</u>	<u>SV86-5-091517</u>	<u>1725-AN-RTN-004</u>	<u>09/15/17</u>	<u>13:15</u>	<u>10/17/17</u>	<u>16:17</u>		x		Modified TO-17 Passive SE	
<u>08A</u>	<u>SV87-5-091517</u>	<u>1725-AN-RTN-003</u>	<u>09/15/17</u>	<u>13:23</u>	<u>10/17/17</u>	<u>16:19</u>		x		Modified TO-17 Passive SE	
<u>09A</u>	<u>SV88-5-091517</u>	<u>1725-AN-RTN-002</u>	<u>09/15/17</u>	<u>13:42</u>	<u>10/17/17</u>	<u>16:32</u>		x		Modified TO-17 Passive SE	
<u>10A</u>	<u>SV89-5-091517</u>	<u>1725-AN-RTN-001</u>	<u>09/15/17</u>	<u>13:54</u>	<u>10/17/17</u>	<u>16:34</u>		x		Modified TO-17 Passive SE	
<u>11A</u>	<u>SV90-5-091517</u>	<u>1725-AN-RTN-020</u>	<u>09/15/17</u>	<u>14:19</u>	<u>10/17/17</u>	<u>16:46</u>		x		Modified TO-17 Passive SE	
<u>12A</u>	<u>SV92-4-091517</u>	<u>1725-AN-RTN-018</u>	<u>09/15/17</u>	<u>15:59</u>	<u>10/17/17</u>	<u>16:56</u>		x		Modified TO-17 Passive SE	
<u>13A - on 10/20/17</u>											
Relinquished by: 		Date: <u>10-19-17</u>	Time: <u>14:00</u>	Received by: <u>alvin GAR</u>		Date: <u>10/20/17</u>	Time: <u>1010</u>	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed			
Relinquished by:		Date:	Time:	Received by:		Date:	Time:				
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.											
Lab Use Only											
Shipper Name: <u>Fed Ex</u>		Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None		Blue Ice present or insulated cooler used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							
		Sample Condition Upon Receipt: <u>Good</u>		CEB 10/20/17							

11/1/2017  
Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane WA 99201

Project Name: UPRR Freeman  
Project #:  
Workorder #: 1710403

Dear Mr. Steve Demus

The following report includes the data for the above referenced project for sample(s) received on 10/20/2017 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager



**WORK ORDER #: 1710403**

Work Order Summary

<b>CLIENT:</b>	Mr. Steve Demus CH2M Hill 999 W. Riverside Ave Suite 500 Spokane, WA 99201	<b>BILL TO:</b>	Ms. Ashley Bonin Pace Analytical Services 1700 Elm St. Minneapolis, MN 55414
<b>PHONE:</b>	509.464.7222	<b>P.O. #</b>	
<b>FAX:</b>		<b>PROJECT #</b>	UPRR Freeman
<b>DATE RECEIVED:</b>	10/20/2017	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	11/01/2017		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	SV80-5-091517	Passive S.E. WMS
02A	SV81-5-091517	Passive S.E. WMS
03A	SV82-5-091517	Passive S.E. WMS
04A	SV83-5-091517	Passive S.E. WMS
05A	SV84-5-091517	Passive S.E. WMS
06A	SV85-5-091517	Passive S.E. WMS
07A	SV86-5-091517	Passive S.E. WMS
08A	SV87-5-091517	Passive S.E. WMS
09A	SV88-5-091517	Passive S.E. WMS
10A	SV89-5-091517	Passive S.E. WMS
11A	SV90-5-091517	Passive S.E. WMS
12A	SV92-4-091517	Passive S.E. WMS
13A	Lab Blank	Passive S.E. WMS
14A	LCS	Passive S.E. WMS
14AA	LCSD	Passive S.E. WMS

CERTIFIED BY:   
 Technical Director

DATE: 11/01/17

**LABORATORY NARRATIVE**  
**WMS Passive SE by Mod EPA TO-17**  
**CH2M Hill**  
**Workorder# 1710403**

Twelve WMS-TM samples were received on October 20, 2017. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

To calculate ug/m3 concentrations in the Lab Blank, a sampling duration of 46318 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field

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temperatures were provided, the rate was adjusted in the same manner as the field samples.

### **Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

## Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV80-5-091517**

**Lab ID#: 1710403-01A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.12	14

**Client Sample ID: SV81-5-091517**

**Lab ID#: 1710403-02A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.40	48

**Client Sample ID: SV82-5-091517**

**Lab ID#: 1710403-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.31	37

**Client Sample ID: SV83-5-091517**

**Lab ID#: 1710403-04A**

No Detections Were Found.

**Client Sample ID: SV84-5-091517**

**Lab ID#: 1710403-05A**

No Detections Were Found.

**Client Sample ID: SV85-5-091517**

**Lab ID#: 1710403-06A**

No Detections Were Found.

**Client Sample ID: SV86-5-091517**

**Lab ID#: 1710403-07A**

No Detections Were Found.

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV87-5-091517**

**Lab ID#: 1710403-08A**

No Detections Were Found.

**Client Sample ID: SV88-5-091517**

**Lab ID#: 1710403-09A**

No Detections Were Found.

**Client Sample ID: SV89-5-091517**

**Lab ID#: 1710403-10A**

No Detections Were Found.

**Client Sample ID: SV90-5-091517**

**Lab ID#: 1710403-11A**

No Detections Were Found.

**Client Sample ID: SV92-4-091517**

**Lab ID#: 1710403-12A**

<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Carbon Tetrachloride	0.050	6.0	0.21	26



Air Toxics

Client Sample ID: SV80-5-091517

Lab ID#: 1710403-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102314sim	Date of Collection:	10/17/17 3:38:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 03:19 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.12	14

Temperature = 77.0F , duration time = 46318 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV81-5-091517

Lab ID#: 1710403-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102315sim	Date of Collection:	10/17/17 3:39:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 03:44 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.40	48

Temperature = 77.0F , duration time = 46301 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130

Client Sample ID: SV82-5-091517

Lab ID#: 1710403-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102316sim	Date of Collection:	10/17/17 3:49:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 04:10 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.31	37

Temperature = 77.0F , duration time = 46270 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130





Air Toxics

Client Sample ID: SV83-5-091517

Lab ID#: 1710403-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102317sim	Date of Collection:	10/17/17 3:53:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 04:35 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46269 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV84-5-091517

Lab ID#: 1710403-05A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102318sim	Date of Collection:	10/17/17 4:04:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 05:01 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46271 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: SV85-5-091517

Lab ID#: 1710403-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102319sim	Date of Collection:	10/17/17 4:13:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 05:26 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46268 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: SV86-5-091517

Lab ID#: 1710403-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102320sim	Date of Collection:	10/17/17 4:17:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 05:51 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46262 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130



Air Toxics

Client Sample ID: SV87-5-091517

Lab ID#: 1710403-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102321sim	Date of Collection:	10/17/17 4:19:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 06:17 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46256 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV88-5-091517

Lab ID#: 1710403-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102322sim	Date of Collection:	10/17/17 4:32:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 06:42 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46250 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: SV89-5-091517

Lab ID#: 1710403-10A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102323sim	Date of Collection:	10/17/17 4:34:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 07:08 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46240 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Air Toxics

Client Sample ID: SV90-5-091517

Lab ID#: 1710403-11A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102324sim	Date of Collection:	10/17/17 4:46:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 07:33 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46227 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130





Air Toxics

Client Sample ID: SV92-4-091517

Lab ID#: 1710403-12A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102325sim	Date of Collection:	10/17/17 4:56:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/23/17 07:58 PM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.21	26

Temperature = 77.0F , duration time = 46137 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1710403-13A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102305sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/23/17 11:29 AM
		Date of Extraction:	10/23/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46318 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

Client Sample ID: LCS

Lab ID#: 1710403-14A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102303sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/23/17 10:38 AM
		Date of Extraction: 10/23/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	96	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130

Client Sample ID: LCSD

Lab ID#: 1710403-14AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10102304sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/23/17 11:04 AM
		Date of Extraction:	10/23/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

November 02, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman WA-Grain Handling Faci  
Pace Project No.: 10408193

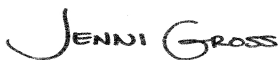
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 23, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

## SAMPLE SUMMARY

Project: Freeman WA-Grain Handling Faci

Pace Project No.: 10408193

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10408193001	SV54-5-091417	Air	10/17/17 11:48	10/23/17 10:25
10408193002	SV55-5-091417	Air	10/17/17 12:01	10/23/17 10:25
10408193003	SV56-5-091517	Air	10/17/17 12:06	10/23/17 10:25
10408193004	SV57-5-091517	Air	10/17/17 12:11	10/23/17 10:25
10408193005	SV58-5-091517	Air	10/17/17 12:21	10/23/17 10:25
10408193006	SV59-5-091517	Air	10/17/17 12:26	10/23/17 10:25
10408193007	SV60-5-091517	Air	10/17/17 13:24	10/23/17 10:25
10408193008	SV61-5-091517	Air	10/17/17 13:29	10/23/17 10:25
10408193009	SV62-5-091517	Air	10/17/17 13:35	10/23/17 10:25
10408193010	SV63-5-091517	Air	10/17/17 13:40	10/23/17 10:25
10408193011	SV64-5-091517	Air	10/17/17 13:45	10/23/17 10:25
10408193012	SV65-5-091517	Air	10/17/17 13:52	10/23/17 10:25
10408193013	SV66-5-091517	Air	10/17/17 13:57	10/23/17 10:25

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project:  
Pace Project No.:

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**Method:**  
**Description:**  
**Client:**  
**Date:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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Passive Sorbent Chain of Custody

Case Seal #: 0395535

WO#: 1710438

Company: CH2M/Pace		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:	
Project Manager: David Hodson/CH2M		Project Name: UPRR Freeman				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other	ppbv ug/m3 <input checked="" type="checkbox"/> Normal	Specify
Contact phone/email: 510 316-2323		Collected by: Paul Humphreys/CH2M								ppmv mg/m3 <input type="checkbox"/> Rush	
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)				Analysis Requested	Sample Comments:
14A	01A SV54-5-091417	1725-AN-RTN-036	09/14/17	15:24	10/17/17	11:48		x		Modified TO-17 Passive SE	
15A	02A SV55-5-091417	1725-AN-RTN-037	09/14/17	15:35	10/17/17	12:01		x		Modified TO-17 Passive SE	
16A	03A SV56-5-091517	1725-AN-RTN-035	09/15/17	07:07	10/17/17	12:06		x		Modified TO-17 Passive SE	
17A	04A SV57-5-091517	1725-AN-RTN-031	09/15/17	07:14	10/17/17	12:11		x		Modified TO-17 Passive SE	
18A	05A SV58-5-091517	1725-AN-RTN-034	09/15/17	07:20	10/17/17	12:21		x		Modified TO-17 Passive SE	
19A	06A SV59-5-091517	1725-AN-RTN-033	09/15/17	07:45	10/17/17	12:26		x		Modified TO-17 Passive SE	
20A	07A SV60-5-091517	1725-AN-RTN-032	09/15/17	07:51	10/17/17	13:24		x		Modified TO-17 Passive SE	
21A	08A SV61-5-091517	1725-AN-RTN-090	09/15/17	07:59	10/17/17	13:29		x		Modified TO-17 Passive SE	
22A	09A SV62-5-091517	1725-AN-RTN-089	09/15/17	08:06	10/17/17	13:35		x		Modified TO-17 Passive SE	
23A	10A SV63-5-091517	1725-AN-RTN-087	09/15/17	08:16	10/17/17	13:40		x		Modified TO-17 Passive SE	
24A	11A SV64-5-091517	1725-AN-RTN-086	09/15/17	08:23	10/17/17	13:45		x		Modified TO-17 Passive SE	
25A	12A SV65-5-091517	1725-AN-RTN-085	09/15/17	08:36	10/17/17	13:52		x		Modified TO-17 Passive SE	
26A	13A SV66-5-091517	1725-AN-RTN-084	09/15/17	08:45	10/17/17	13:57		x		Modified TO-17 Passive SE	
Relinquished by:			Date: 10-19-17	Time: 14:00	Received by:		Date: 10/23/17	Time: 10:25	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed		
Relinquished by:			Date:	Time:	Received by:		Date:	Time:			
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.											
Lab Use Only											
Shipper Name: Fed Ex			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None			Blue Ice present or insulated cooler used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
			Sample Condition Upon Receipt: good						1710438		



11/2/2017  
Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane WA 99201

Project Name: UPRR Freeman  
Project #:  
Workorder #: 1710438

Dear Mr. Steve Demus

The following report includes the data for the above referenced project for sample(s) received on 10/23/2017 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**WORK ORDER #: 1710438**

Work Order Summary

<b>CLIENT:</b>	Mr. Steve Demus CH2M Hill 999 W. Riverside Ave Suite 500 Spokane, WA 99201	<b>BILL TO:</b>	Ms. Ashley Bonin Pace Analytical Services 1700 Elm St. Minneapolis, MN 55414
<b>PHONE:</b>	509.464.7222	<b>P.O. #</b>	
<b>FAX:</b>		<b>PROJECT #</b>	UPRR Freeman
<b>DATE RECEIVED:</b>	10/23/2017	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	11/02/2017		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	SV54-5-091417	Passive S.E. WMS
02A	SV55-5-091417	Passive S.E. WMS
03A	SV56-5-091517	Passive S.E. WMS
04A	SV57-5-091517	Passive S.E. WMS
05A	SV58-5-091517	Passive S.E. WMS
06A	SV59-5-091517	Passive S.E. WMS
07A	SV60-5-091517	Passive S.E. WMS
08A	SV61-5-091517	Passive S.E. WMS
09A	SV62-5-091517	Passive S.E. WMS
10A	SV63-5-091517	Passive S.E. WMS
11A	SV64-5-091517	Passive S.E. WMS
12A	SV65-5-091517	Passive S.E. WMS
13A	SV66-5-091517	Passive S.E. WMS
14A	Lab Blank	Passive S.E. WMS
15A	LCS	Passive S.E. WMS
15AA	LCSD	Passive S.E. WMS

CERTIFIED BY:   
 Technical Director

DATE: 11/02/17

**LABORATORY NARRATIVE**  
**WMS Passive SE by Mod EPA TO-17**  
**CH2M Hill**  
**Workorder# 1710438**

Thirteen WMS-TM samples were received on October 23, 2017. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

To calculate ug/m3 concentrations in the Lab Blank, a sampling duration of 47306 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field

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temperatures were provided, the rate was adjusted in the same manner as the field samples.

### **Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

### Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV54-5-091417**

**Lab ID#: 1710438-01A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.12	15

**Client Sample ID: SV55-5-091417**

**Lab ID#: 1710438-02A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.34	40

**Client Sample ID: SV56-5-091517**

**Lab ID#: 1710438-03A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	1.8	210

**Client Sample ID: SV57-5-091517**

**Lab ID#: 1710438-04A**

No Detections Were Found.

**Client Sample ID: SV58-5-091517**

**Lab ID#: 1710438-05A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	1.2	150

**Client Sample ID: SV59-5-091517**

**Lab ID#: 1710438-06A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.74	88

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV60-5-091517**

**Lab ID#: 1710438-07A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.21	25

**Client Sample ID: SV61-5-091517**

**Lab ID#: 1710438-08A**

No Detections Were Found.

**Client Sample ID: SV62-5-091517**

**Lab ID#: 1710438-09A**

No Detections Were Found.

**Client Sample ID: SV63-5-091517**

**Lab ID#: 1710438-10A**

No Detections Were Found.

**Client Sample ID: SV64-5-091517**

**Lab ID#: 1710438-11A**

No Detections Were Found.

**Client Sample ID: SV65-5-091517**

**Lab ID#: 1710438-12A**

No Detections Were Found.

**Client Sample ID: SV66-5-091517**

**Lab ID#: 1710438-13A**

No Detections Were Found.



Air Toxics

Client Sample ID: SV54-5-091417

Lab ID#: 1710438-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103111sim	Date of Collection:	10/17/17 11:48:00 A
Dil. Factor:	1.00	Date of Analysis:	10/31/17 12:40 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.12	15

Temperature = 77.0F , duration time = 47304 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV55-5-091417

Lab ID#: 1710438-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103112sim	Date of Collection:	10/17/17 12:01:00 P
Dil. Factor:	1.00	Date of Analysis:	10/31/17 01:06 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.34	40

Temperature = 77.0F , duration time = 47306 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130





Air Toxics

Client Sample ID: SV56-5-091517

Lab ID#: 1710438-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103113sim	Date of Collection:	10/17/17 12:06:00 P
Dil. Factor:	1.00	Date of Analysis:	10/31/17 01:31 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	1.8	210

Temperature = 77.0F , duration time = 46379 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130

Client Sample ID: SV57-5-091517

Lab ID#: 1710438-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103114sim	Date of Collection:	10/17/17 12:11:00 P
Dil. Factor:	1.00	Date of Analysis:	10/31/17 01:57 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46377 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV58-5-091517

Lab ID#: 1710438-05A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103115sim	Date of Collection:	10/17/17 12:21:00 P
Dil. Factor:	1.00	Date of Analysis:	10/31/17 02:22 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	1.2	150

Temperature = 77.0F , duration time = 46381 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV59-5-091517

Lab ID#: 1710438-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103116sim	Date of Collection:	10/17/17 12:26:00 P
Dil. Factor:	1.00	Date of Analysis:	10/31/17 02:48 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.74	88

Temperature = 77.0F , duration time = 46361 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV60-5-091517

Lab ID#: 1710438-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103117sim	Date of Collection:	10/17/17 1:24:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 03:13 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.21	25

Temperature = 77.0F , duration time = 46413 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV61-5-091517

Lab ID#: 1710438-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103118sim	Date of Collection:	10/17/17 1:29:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 03:39 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46410 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV62-5-091517

Lab ID#: 1710438-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103119sim	Date of Collection:	10/17/17 1:35:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 04:04 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46409 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130



Air Toxics

Client Sample ID: SV63-5-091517

Lab ID#: 1710438-10A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103120sim	Date of Collection:	10/17/17 1:40:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 04:30 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46404 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130





Air Toxics

Client Sample ID: SV64-5-091517

Lab ID#: 1710438-11A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103121sim	Date of Collection:	10/17/17 1:45:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 04:55 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46402 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV65-5-091517

Lab ID#: 1710438-12A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103122sim	Date of Collection:	10/17/17 1:52:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 05:20 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46396 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV66-5-091517

Lab ID#: 1710438-13A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103123sim	Date of Collection:	10/17/17 1:57:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/31/17 05:46 PM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46392 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130

Client Sample ID: Lab Blank

Lab ID#: 1710438-14A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103105sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/31/17 10:07 AM
		Date of Extraction:	10/31/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47306 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	0-130

Client Sample ID: LCS

Lab ID#: 1710438-15A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103103sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/31/17 09:17 AM
		Date of Extraction: 10/31/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	87	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130

Client Sample ID: LCSD

Lab ID#: 1710438-15AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103104sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/31/17 09:42 AM
		Date of Extraction:	10/31/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	84	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130

November 02, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman WA-Grain Handling Faci  
Pace Project No.: 10408197

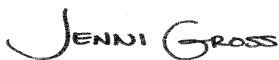
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 23, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## SAMPLE SUMMARY

Project: Freeman WA-Grain Handling Faci

Pace Project No.: 10408197

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10408197001	SV40-5-091417	Air	10/17/17 10:10	10/23/17 10:25
10408197002	SV41-5-091417	Air	10/17/17 10:11	10/23/17 10:25
10408197003	SV42-5-091417	Air	10/17/17 10:19	10/23/17 10:25
10408197004	SV43-5-091417	Air	10/17/17 10:21	10/23/17 10:25
10408197005	SV44-5-091417	Air	10/17/17 10:28	10/23/17 10:25
10408197006	SV45-5-091417	Air	10/17/17 10:29	10/23/17 10:25
10408197007	SV46-5-091417	Air	10/17/17 10:53	10/23/17 10:25
10408197008	SV47-5-091417	Air	10/17/17 10:58	10/23/17 10:25
10408197009	SV49-5-091417	Air	10/17/17 11:11	10/23/17 10:25
10408197010	SV50-5-091417	Air	10/17/17 11:18	10/23/17 10:25
10408197011	SV51-5-091417	Air	10/17/17 11:25	10/23/17 10:25
10408197012	SV52-5-091417	Air	10/17/17 11:37	10/23/17 10:25
10408197013	SV53-5-091417	Air	10/17/17 11:43	10/23/17 10:25

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project:  
Pace Project No.:

---

**Method:**  
**Description:**  
**Client:**  
**Date:**

This data package has been reviewed for quality and completeness and is approved for release.


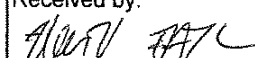
## REPORT OF LABORATORY ANALYSIS

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Passive Sorbent Chain of Custody

Case Seal #: 0395535

WO#:

Company: <u>CH2M/Pace</u>		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:	
Project Manager: <u>David Hodson/CH2M</u>		Project Name: <u>UPRR Freeman</u>				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other ( )	ppbv ug/m3 <input checked="" type="checkbox"/> Normal	
Contact phone/email: <u>510 316-2323</u>		Collected by: <u>Paul Humphreys/CH2M</u>								ppmv mg/m3 <input type="checkbox"/> Rush	
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)				Analysis Requested	Sample Comments:
<u>01A</u>	SV40-5-091417	1725-AN-RTN-071	09/14/17	11:55	10/17/17	10:10		x		Modified TO-17 Passive SE	
<u>02A</u>	SV41-5-091417	1725-AN-RTN-030	09/14/17	12:04	10/17/17	10:11		x		Modified TO-17 Passive SE	
<u>03A</u>	SV42-5-091417	1725-AN-RTN-029	09/14/17	12:16	10/17/17	10:19		x		Modified TO-17 Passive SE	
<u>04A</u>	SV43-5-091417	1725-AN-RTN-028	09/14/17	12:35	10/17/17	10:21		x		Modified TO-17 Passive SE	
<u>05A</u>	SV44-5-091417	1725-AN-RTN-027	09/14/17	12:45	10/17/17	10:28		x		Modified TO-17 Passive SE	
<u>06A</u>	SV45-5-091417	1725-AN-RTN-026	09/14/17	12:59	10/17/17	10:29		x		Modified TO-17 Passive SE	
<u>07A</u>	SV46-5-091417	1725-AN-RTN-025	09/14/17	13:49	10/17/17	10:53		x		Modified TO-17 Passive SE	
<u>08A</u>	SV47-5-091417	1725-AN-RTN-024	09/14/17	14:00	10/17/17	10:58		x		Modified TO-17 Passive SE	
<u>09A</u>	SV49-5-091417	1725-AN-RTN-022	09/14/17	14:20	10/17/17	11:11		x		Modified TO-17 Passive SE	
<u>10A</u>	SV50-5-091417	1725-AN-RTN-021	09/14/17	14:39	10/17/17	11:18		x		Modified TO-17 Passive SE	
<u>11A</u>	SV51-5-091417	1725-AN-RTN-040	09/14/17	14:53	10/17/17	11:25		x		Modified TO-17 Passive SE	
<u>12A</u>	SV52-5-091417	1725-AN-RTN-039	09/14/17	15:07	10/17/17	11:37		x		Modified TO-17 Passive SE	
<u>13A</u>	SV53-5-091417	1725-AN-RTN-038	09/14/17	15:16	10/17/17	11:43		x		Modified TO-17 Passive SE	
Relinquished by: 			Date: <u>10-19-17</u>	Time: <u>14:00</u>	Received by: 		Date: <u>10/23/17</u>	Time: <u>10:25</u>	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed		
Relinquished by:			Date:	Time:	Received by:		Date:	Time:			
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.											
Lab Use Only											
Shipper Name: <u>Feld</u>			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None			Blue Ice present or insulated cooler used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
			Sample Condition Upon Receipt: <u>good</u>						<u>1710437</u>		

11/2/2017  
Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane WA 99201

Project Name: UPRR Freeman  
Project #:  
Workorder #: 1710437

Dear Mr. Steve Demus

The following report includes the data for the above referenced project for sample(s) received on 10/23/2017 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**WORK ORDER #: 1710437**

Work Order Summary

<b>CLIENT:</b>	Mr. Steve Demus CH2M Hill 999 W. Riverside Ave Suite 500 Spokane, WA 99201	<b>BILL TO:</b>	Ms. Ashley Bonin Pace Analytical Services 1700 Elm St. Minneapolis, MN 55414
<b>PHONE:</b>	509.464.7222	<b>P.O. #</b>	
<b>FAX:</b>		<b>PROJECT #</b>	UPRR Freeman
<b>DATE RECEIVED:</b>	10/23/2017	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	11/02/2017		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	SV40-5-091417	Passive S.E. WMS
02A	SV41-5-091417	Passive S.E. WMS
03A	SV42-5-091417	Passive S.E. WMS
04A	SV43-5-091417	Passive S.E. WMS
05A	SV44-5-091417	Passive S.E. WMS
06A	SV45-5-091417	Passive S.E. WMS
07A	SV46-5-091417	Passive S.E. WMS
08A	SV47-5-091417	Passive S.E. WMS
09A	SV49-5-091417	Passive S.E. WMS
10A	SV50-5-091417	Passive S.E. WMS
11A	SV51-5-091417	Passive S.E. WMS
12A	SV52-5-091417	Passive S.E. WMS
13A	SV53-5-091417	Passive S.E. WMS
14A	Lab Blank	Passive S.E. WMS
15A	LCS	Passive S.E. WMS
15AA	LCSD	Passive S.E. WMS

CERTIFIED BY:   
 \_\_\_\_\_  
 Technical Director

DATE: 11/02/17 \_\_\_\_\_

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630  
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**WMS Passive SE by Mod EPA TO-17**  
**CH2M Hill**  
**Workorder# 1710437**

Thirteen WMS-TM samples were received on October 23, 2017. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

To calculate ug/m3 concentrations in the Lab Blank, a sampling duration of 47415 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field

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temperatures were provided, the rate was adjusted in the same manner as the field samples.

### **Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

## Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV40-5-091417**

**Lab ID#: 1710437-01A**

No Detections Were Found.

**Client Sample ID: SV41-5-091417**

**Lab ID#: 1710437-02A**

No Detections Were Found.

**Client Sample ID: SV42-5-091417**

**Lab ID#: 1710437-03A**

No Detections Were Found.

**Client Sample ID: SV43-5-091417**

**Lab ID#: 1710437-04A**

No Detections Were Found.

**Client Sample ID: SV44-5-091417**

**Lab ID#: 1710437-05A**

No Detections Were Found.

**Client Sample ID: SV45-5-091417**

**Lab ID#: 1710437-06A**

No Detections Were Found.

**Client Sample ID: SV46-5-091417**

**Lab ID#: 1710437-07A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.14	16

**Client Sample ID: SV47-5-091417**

**Lab ID#: 1710437-08A**

No Detections Were Found.

### Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV49-5-091417**

**Lab ID#: 1710437-09A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	3.3	390

**Client Sample ID: SV50-5-091417**

**Lab ID#: 1710437-10A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.78	92

**Client Sample ID: SV51-5-091417**

**Lab ID#: 1710437-11A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.38	44

**Client Sample ID: SV52-5-091417**

**Lab ID#: 1710437-12A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	1.2	140

**Client Sample ID: SV53-5-091417**

**Lab ID#: 1710437-13A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	4.1	480





Air Toxics

Client Sample ID: SV40-5-091417

Lab ID#: 1710437-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103012sim	Date of Collection:	10/17/17 10:10:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:05 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47415 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV41-5-091417

Lab ID#: 1710437-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103013sim	Date of Collection:	10/17/17 10:11:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:31 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47407 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130



Air Toxics

Client Sample ID: SV42-5-091417

Lab ID#: 1710437-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103014sim	Date of Collection:	10/17/17 10:19:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:56 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47403 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130

Client Sample ID: SV43-5-091417

Lab ID#: 1710437-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103015sim	Date of Collection:	10/17/17 10:21:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 02:21 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47386 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130

Client Sample ID: SV44-5-091417

Lab ID#: 1710437-05A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103016sim	Date of Collection:	10/17/17 10:28:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 02:47 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47383 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130



Air Toxics

Client Sample ID: SV45-5-091417

Lab ID#: 1710437-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103017sim	Date of Collection:	10/17/17 10:29:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 03:12 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47370 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130



Air Toxics

Client Sample ID: SV46-5-091417

Lab ID#: 1710437-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103018sim	Date of Collection:	10/17/17 10:53:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 03:38 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.14	16

Temperature = 77.0F , duration time = 47344 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV47-5-091417

Lab ID#: 1710437-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103019sim	Date of Collection:	10/17/17 10:58:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 04:03 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47338 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130





Air Toxics

Client Sample ID: SV49-5-091417

Lab ID#: 1710437-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103020sim	Date of Collection:	10/17/17 11:11:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 04:28 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	3.3	390

Temperature = 77.0F , duration time = 47331 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: SV50-5-091417

Lab ID#: 1710437-10A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103021sim	Date of Collection:	10/17/17 11:18:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 04:53 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.78	92

Temperature = 77.0F , duration time = 47319 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV51-5-091417

Lab ID#: 1710437-11A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103022sim	Date of Collection:	10/17/17 11:25:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 05:19 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	0.38	44

Temperature = 77.0F , duration time = 47312 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV52-5-091417

Lab ID#: 1710437-12A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103023sim	Date of Collection:	10/17/17 11:37:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 05:44 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	1.2	140

Temperature = 77.0F , duration time = 47310 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



Air Toxics

Client Sample ID: SV53-5-091417

Lab ID#: 1710437-13A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103024sim	Date of Collection:	10/17/17 11:43:00 A
Dil. Factor:	1.00	Date of Analysis:	10/30/17 06:09 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.9	4.1	480

Temperature = 77.0F , duration time = 47307 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130

Client Sample ID: Lab Blank

Lab ID#: 1710437-14A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103010sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/17 12:13 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	5.8	Not Detected	Not Detected

Temperature = 77.0F , duration time = 47415 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130

Client Sample ID: LCS

Lab ID#: 1710437-15A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103008sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/30/17 11:22 AM
		Date of Extraction: 10/30/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	90	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130

Client Sample ID: LCSD

Lab ID#: 1710437-15AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	10103009sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/30/17 11:48 AM
		Date of Extraction: 10/30/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	99	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130



November 02, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: Freeman WA-Grain Handling Faci  
Pace Project No.: 10408200

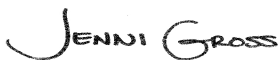
Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on October 23, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Freeman WA-Grain Handling Faci

Pace Project No.: 10408200

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10408200001	SV67-5-091517	Air	10/17/17 13:58	10/23/17 10:25
10408200002	SV68-5-091517	Air	10/17/17 14:06	10/23/17 10:25
10408200003	SV69-5-091517	Air	10/17/17 14:15	10/23/17 10:25
10408200004	SV70-5-091517	Air	10/17/17 14:17	10/23/17 10:25
10408200005	SV71-5-091517	Air	10/17/17 14:25	10/23/17 10:25
10408200006	SV72-5-091517	Air	10/17/17 14:31	10/23/17 10:25
10408200007	SV73-5-091517	Air	10/17/17 14:41	10/23/17 10:25
10408200008	SV74-5-091517	Air	10/17/17 14:44	10/23/17 10:25
10408200009	SV75-5-091517	Air	10/17/17 14:52	10/23/17 10:25
10408200010	SV76-5-091517	Air	10/17/17 14:57	10/23/17 10:25
10408200011	SV77-5-091517	Air	10/17/17 15:06	10/23/17 10:25
10408200012	SV78-5-091517	Air	10/17/17 15:18	10/23/17 10:25

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project:  
Pace Project No.:

---

**Method:**  
**Description:**  
**Client:**  
**Date:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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**Passive Sorbent Chain of Custody**

Case Seal #: 0395535

WO#: 1710439

Company: CH2M/Pace		Project #: _____		P.O.# _____		Sample Matrix (check one)		Reporting Units (circle)		Turn Around Time:		
Project Manager: David Hodson/CH2M		Project Name: UPRR Freeman				Indoor/Outdoor Air	Soil Gas	Workplace Monitoring	Other ( )	ppbv ug/m3 <input checked="" type="checkbox"/> Normal	Specify	
Contact phone/email: 510 316-2323		Collected by: Paul Humphreys/CH2M								ppmv mg/m3 <input type="checkbox"/> Rush		
Lab ID	Sample Identification	Sampler ID	Date of Deployment (mm/dd/yy)	Time of Deployment (hr:min)	Date of Retrieval (mm/dd/yy)	Time of Retrieval (hr:min)				Analysis Requested	Sample Comments:	
0117	SV67-5-091517	1725-AN-RTN-083	09/15/17	08:54	10/17/17	13:58		x		Modified TO-17 Passive SE		
0121	SV68-5-091517	1725-AN-RTN-082	09/15/17	09:05	10/17/17	14:06		x		Modified TO-17 Passive SE		
0127	SV69-5-091517	1725-AN-RTN-081	09/15/17	09:13	10/17/17	14:15		x		Modified TO-17 Passive SE		
0119	SV70-5-091517	1725-AN-RTN-100	09/15/17	09:21	10/17/17	14:17		x		Modified TO-17 Passive SE		
0125	SV71-5-091517	1725-AN-RTN-099	09/15/17	09:27	10/17/17	14:25		x		Modified TO-17 Passive SE		
0126	SV72-5-091517	1725-AN-RTN-098	09/15/17	09:35	10/17/17	14:31		x		Modified TO-17 Passive SE		
0128	SV73-5-091517	1725-AN-RTN-097	09/15/17	10:07	10/17/17	14:41		x		Modified TO-17 Passive SE		
0129	SV74-5-091517	1725-AN-RTN-096	09/15/17	10:15	10/17/17	14:44		x		Modified TO-17 Passive SE		
0130	SV75-5-091517	1725-AN-RTN-095	09/15/17	10:25	10/17/17	14:52		x		Modified TO-17 Passive SE		
0131	SV76-5-091517	1725-AN-RTN-094	09/15/17	10:35	10/17/17	14:57		x		Modified TO-17 Passive SE		
0132	SV77-5-091517	1725-AN-RTN-093	09/15/17	10:44	10/17/17	15:06		x		Modified TO-17 Passive SE		
0133	SV78-5-091517	1725-AN-RTN-092	09/15/17	10:56	10/17/17	15:18		x		Modified TO-17 Passive SE		
Relinquished by:			Date: 10-19-17	Time: 14:00	Received by:		Date: 10/23/17	Time: 10:25	Notes to Lab: Samples SV01, SV09, SV21, SV22, SV48, and SV91 not retrieved; Samples SV79 and SV93 not deployed			
Relinquished by:			Date:	Time:	Received by:		Date:	Time:				
Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples.												
Lab Use Only												
Shipper Name:			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> None		Blue Ice present or insulated cooler used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							
			Sample Condition Upon Receipt:								U.V. 10/23/17 1710439	

11/2/2017  
Mr. Steve Demus  
CH2M Hill  
999 W. Riverside Ave  
Suite 500  
Spokane WA 99201

Project Name: UPRR Freeman  
Project #:  
Workorder #: 1710439

Dear Mr. Steve Demus

The following report includes the data for the above referenced project for sample(s) received on 10/23/2017 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**WORK ORDER #: 1710439**

Work Order Summary

<b>CLIENT:</b>	Mr. Steve Demus CH2M Hill 999 W. Riverside Ave Suite 500 Spokane, WA 99201	<b>BILL TO:</b>	Ms. Ashley Bonin Pace Analytical Services 1700 Elm St. Minneapolis, MN 55414
<b>PHONE:</b>	509.464.7222	<b>P.O. #</b>	
<b>FAX:</b>		<b>PROJECT #</b>	UPRR Freeman
<b>DATE RECEIVED:</b>	10/23/2017	<b>CONTACT:</b>	Kelly Buettner
<b>DATE COMPLETED:</b>	11/02/2017		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	SV67-5-091517	Passive S.E. WMS
02A	SV68-5-091517	Passive S.E. WMS
03A	SV69-5-091517	Passive S.E. WMS
04A	SV70-5-091517	Passive S.E. WMS
05A(cancelled)	SV71-5-091517	Passive S.E. WMS
06A	SV72-5-091517	Passive S.E. WMS
07A	SV73-5-091517	Passive S.E. WMS
08A	SV74-5-091517	Passive S.E. WMS
09A	SV75-5-091517	Passive S.E. WMS
10A	SV76-5-091517	Passive S.E. WMS
11A	SV77-5-091517	Passive S.E. WMS
12A	SV78-5-091517	Passive S.E. WMS
13A	Lab Blank	Passive S.E. WMS
14A	LCS	Passive S.E. WMS
14AA	LCSD	Passive S.E. WMS

CERTIFIED BY:   
 Technical Director

DATE: 11/02/17

**LABORATORY NARRATIVE**  
**WMS Passive SE by Mod EPA TO-17**  
**CH2M Hill**  
**Workorder# 1710439**

Twelve WMS-TM samples were received on October 23, 2017. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

**Receiving Notes**

The cartridge for sample SV71-5-091517 was broken while still encased in bubble wrap and foil. Following client notification of this event, analysis was cancelled.

**Analytical Notes**

To calculate ug/m<sup>3</sup> concentrations in the Lab Blank, a sampling duration of 46384 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

**Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue



## Summary of Detected Compounds VOC BY PASSIVE SAMPLER - GC/MS

**Client Sample ID: SV67-5-091517**

**Lab ID#: 1710439-01A**

No Detections Were Found.

**Client Sample ID: SV68-5-091517**

**Lab ID#: 1710439-02A**

No Detections Were Found.

**Client Sample ID: SV69-5-091517**

**Lab ID#: 1710439-03A**

No Detections Were Found.

**Client Sample ID: SV70-5-091517**

**Lab ID#: 1710439-04A**

No Detections Were Found.

**Client Sample ID: SV72-5-091517**

**Lab ID#: 1710439-06A**

No Detections Were Found.

**Client Sample ID: SV73-5-091517**

**Lab ID#: 1710439-07A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.057	6.9

**Client Sample ID: SV74-5-091517**

**Lab ID#: 1710439-08A**

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.076	9.1

**Client Sample ID: SV75-5-091517**

**Lab ID#: 1710439-09A**

**Summary of Detected Compounds  
VOC BY PASSIVE SAMPLER - GC/MS**

**Client Sample ID: SV75-5-091517**

**Lab ID#: 1710439-09A**

<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Carbon Tetrachloride	0.050	6.0	0.75	90

**Client Sample ID: SV76-5-091517**

**Lab ID#: 1710439-10A**

<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Carbon Tetrachloride	0.050	6.0	0.33	39

**Client Sample ID: SV77-5-091517**

**Lab ID#: 1710439-11A**

<b>Compound</b>	<b>Rpt. Limit (ug)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug)</b>	<b>Amount (ug/m3)</b>
Carbon Tetrachloride	0.050	6.0	1.7	210

**Client Sample ID: SV78-5-091517**

**Lab ID#: 1710439-12A**

No Detections Were Found.



Air Toxics

Client Sample ID: SV67-5-091517

Lab ID#: 1710439-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103015sim	Date of Collection:	10/17/20 1:58:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 05:09 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46384 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV68-5-091517

Lab ID#: 1710439-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103016sim	Date of Collection:	10/17/20 2:06:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 05:34 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46381 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV69-5-091517

Lab ID#: 1710439-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103017sim	Date of Collection:	10/17/20 2:15:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 05:59 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46382 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV70-5-091517

Lab ID#: 1710439-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103018sim	Date of Collection:	10/17/20 2:17:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 06:23 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46376 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV72-5-091517

Lab ID#: 1710439-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103019sim	Date of Collection:	10/17/20 2:31:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 06:48 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46376 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130



Air Toxics

Client Sample ID: SV73-5-091517

Lab ID#: 1710439-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103020sim	Date of Collection:	10/17/20 2:41:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 07:13 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.057	6.9

Temperature = 77.0F , duration time = 46354 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130





Air Toxics

Client Sample ID: SV74-5-091517

Lab ID#: 1710439-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103021sim	Date of Collection:	10/17/20 2:44:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 07:38 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.076	9.1

Temperature = 77.0F , duration time = 46349 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



Air Toxics

Client Sample ID: SV75-5-091517

Lab ID#: 1710439-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103022sim	Date of Collection:	10/17/20 2:52:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 08:02 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.75	90

Temperature = 77.0F , duration time = 46347 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV76-5-091517

Lab ID#: 1710439-10A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103023sim	Date of Collection:	10/17/20 2:57:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 08:27 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	0.33	39

Temperature = 77.0F , duration time = 46342 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	108	70-130



Air Toxics

Client Sample ID: SV77-5-091517

Lab ID#: 1710439-11A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103024sim	Date of Collection:	10/17/20 3:06:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 08:52 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	1.7	210

Temperature = 77.0F , duration time = 46342 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: SV78-5-091517

Lab ID#: 1710439-12A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103025sim	Date of Collection:	10/17/20 3:18:00 PM
Dil. Factor:	1.00	Date of Analysis:	10/30/17 09:16 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46342 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130

Client Sample ID: Lab Blank

Lab ID#: 1710439-13A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103005sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/17 01:00 PM
		Date of Extraction:	10/30/17

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Carbon Tetrachloride	0.050	6.0	Not Detected	Not Detected

Temperature = 77.0F , duration time = 46384 minutes.

Container Type: WMS-TM

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130

Client Sample ID: LCS

Lab ID#: 1710439-14A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103003sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 10/30/17 12:11 PM
		Date of Extraction: 10/30/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

Client Sample ID: LCSD

Lab ID#: 1710439-14AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	c103004sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	10/30/17 12:35 PM
		Date of Extraction:	10/30/17

Compound	%Recovery	Method Limits
Carbon Tetrachloride	111	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



November 15, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

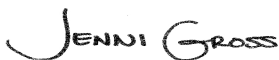
RE: Project: UPRR\_Freeman  
Pace Project No.: 10410064

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on November 07, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: UPRR\_Freeman

Pace Project No.: 10410064

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: UPRR\_Freeman  
Pace Project No.: 10410064

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10410064001	GSNE-S-4	Solid	11/02/17 10:15	11/07/17 10:00
10410064002	GSNE-W	Water	11/02/17 09:20	11/07/17 10:00
10410064003	GSSW-S-5	Solid	11/02/17 11:50	11/07/17 10:00

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### SAMPLE ANALYTE COUNT

Project: UPRR\_Freeman

Pace Project No.: 10410064

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10410064001	GSNE-S-4	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M
10410064002	GSNE-W	EPA 8260B	DJB	83	PASI-M
10410064003	GSSW-S-5	ASTM D2974	JDL	1	PASI-M
		EPA 8260B	CD2	51	PASI-M

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## SUMMARY OF DETECTION

Project: UPRR\_Freeman

Pace Project No.: 10410064

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10410064001</b>	<b>GSNE-S-4</b>					
ASTM D2974	Percent Moisture	18.4	%	0.10	11/08/17 12:14	
EPA 8260B	Methylene Chloride	63.2J	ug/kg	227	11/15/17 09:07	
<b>10410064002</b>	<b>GSNE-W</b>					
EPA 8260B	Acetone	44.1	ug/L	20.0	11/15/17 05:58	
EPA 8260B	Chloromethane	1.3J	ug/L	4.0	11/15/17 05:58	
<b>10410064003</b>	<b>GSSW-S-5</b>					
ASTM D2974	Percent Moisture	22.7	%	0.10	11/08/17 12:14	
EPA 8260B	Methylene Chloride	65.4J	ug/kg	282	11/15/17 09:25	

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## PROJECT NARRATIVE

Project: UPRR\_Freeman

Pace Project No.: 10410064

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**Method:** EPA 8260B

**Description:** 8260B MSV 5030 Med Level

**Client:** UPRR\_CH2M Hill

**Date:** November 15, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: UPRR\_Freeman

Pace Project No.: 10410064

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** November 15, 2017

### General Information:

1 sample was analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- GSNE-W (Lab ID: 10410064002)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: UPRR\_Freeman

Pace Project No.: 10410064

**Sample: GSNE-S-4**      **Lab ID: 10410064001**      Collected: 11/02/17 10:15      Received: 11/07/17 10:00      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight / %M by ASTM D2974</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>18.4</b>	%	0.10	0.10	1		11/08/17 12:14		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B      Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;12.8</b>	ug/kg	56.8	12.8	1	11/14/17 15:31	11/15/17 09:07	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;25.8</b>	ug/kg	56.8	25.8	1	11/14/17 15:31	11/15/17 09:07	79-34-5	
1,1,2-Trichloroethane	<b>&lt;15.5</b>	ug/kg	56.8	15.5	1	11/14/17 15:31	11/15/17 09:07	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;30.0</b>	ug/kg	227	30.0	1	11/14/17 15:31	11/15/17 09:07	76-13-1	
1,1-Dichloroethane	<b>&lt;14.8</b>	ug/kg	56.8	14.8	1	11/14/17 15:31	11/15/17 09:07	75-34-3	
1,1-Dichloroethene	<b>&lt;24.4</b>	ug/kg	56.8	24.4	1	11/14/17 15:31	11/15/17 09:07	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;16.2</b>	ug/kg	56.8	16.2	1	11/14/17 15:31	11/15/17 09:07	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;14.8</b>	ug/kg	56.8	14.8	1	11/14/17 15:31	11/15/17 09:07	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;22.6</b>	ug/kg	56.8	22.6	1	11/14/17 15:31	11/15/17 09:07	106-93-4	
1,2-Dichlorobenzene	<b>&lt;12.4</b>	ug/kg	56.8	12.4	1	11/14/17 15:31	11/15/17 09:07	95-50-1	
1,2-Dichloroethane	<b>&lt;20.8</b>	ug/kg	56.8	20.8	1	11/14/17 15:31	11/15/17 09:07	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;11.0</b>	ug/kg	56.8	11.0	1	11/14/17 15:31	11/15/17 09:07	108-67-8	
1,3-Dichlorobenzene	<b>&lt;19.3</b>	ug/kg	56.8	19.3	1	11/14/17 15:31	11/15/17 09:07	541-73-1	
1,4-Dichlorobenzene	<b>&lt;20.7</b>	ug/kg	56.8	20.7	1	11/14/17 15:31	11/15/17 09:07	106-46-7	
2-Butanone (MEK)	<b>&lt;102</b>	ug/kg	284	102	1	11/14/17 15:31	11/15/17 09:07	78-93-3	
2-Hexanone	<b>&lt;73.2</b>	ug/kg	284	73.2	1	11/14/17 15:31	11/15/17 09:07	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;75.2</b>	ug/kg	284	75.2	1	11/14/17 15:31	11/15/17 09:07	108-10-1	
Acetone	<b>&lt;551</b>	ug/kg	1140	551	1	11/14/17 15:31	11/15/17 09:07	67-64-1	
Benzene	<b>&lt;8.4</b>	ug/kg	22.7	8.4	1	11/14/17 15:31	11/15/17 09:07	71-43-2	
Bromodichloromethane	<b>&lt;20.6</b>	ug/kg	56.8	20.6	1	11/14/17 15:31	11/15/17 09:07	75-27-4	
Bromoform	<b>&lt;41.0</b>	ug/kg	227	41.0	1	11/14/17 15:31	11/15/17 09:07	75-25-2	
Bromomethane	<b>&lt;60.6</b>	ug/kg	568	60.6	1	11/14/17 15:31	11/15/17 09:07	74-83-9	
Carbon tetrachloride	<b>&lt;22.7</b>	ug/kg	227	22.7	1	11/14/17 15:31	11/15/17 09:07	56-23-5	
Chlorobenzene	<b>&lt;16.9</b>	ug/kg	56.8	16.9	1	11/14/17 15:31	11/15/17 09:07	108-90-7	
Chloroethane	<b>&lt;87.0</b>	ug/kg	568	87.0	1	11/14/17 15:31	11/15/17 09:07	75-00-3	
Chloroform	<b>&lt;23.3</b>	ug/kg	56.8	23.3	1	11/14/17 15:31	11/15/17 09:07	67-66-3	
Chloromethane	<b>&lt;36.8</b>	ug/kg	227	36.8	1	11/14/17 15:31	11/15/17 09:07	74-87-3	
Dibromochloromethane	<b>&lt;56.8</b>	ug/kg	227	56.8	1	11/14/17 15:31	11/15/17 09:07	124-48-1	
Dichlorodifluoromethane	<b>&lt;88.6</b>	ug/kg	227	88.6	1	11/14/17 15:31	11/15/17 09:07	75-71-8	
Ethylbenzene	<b>&lt;16.5</b>	ug/kg	56.8	16.5	1	11/14/17 15:31	11/15/17 09:07	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;58.6</b>	ug/kg	284	58.6	1	11/14/17 15:31	11/15/17 09:07	87-68-3	
Methyl-tert-butyl ether	<b>&lt;17.7</b>	ug/kg	56.8	17.7	1	11/14/17 15:31	11/15/17 09:07	1634-04-4	
Methylene Chloride	<b>63.2J</b>	ug/kg	227	29.3	1	11/14/17 15:31	11/15/17 09:07	75-09-2	
Naphthalene	<b>&lt;50.0</b>	ug/kg	227	50.0	1	11/14/17 15:31	11/15/17 09:07	91-20-3	
Styrene	<b>&lt;15.3</b>	ug/kg	56.8	15.3	1	11/14/17 15:31	11/15/17 09:07	100-42-5	
Tetrachloroethene	<b>&lt;23.7</b>	ug/kg	56.8	23.7	1	11/14/17 15:31	11/15/17 09:07	127-18-4	
Tetrahydrofuran	<b>&lt;591</b>	ug/kg	2270	591	1	11/14/17 15:31	11/15/17 09:07	109-99-9	
Toluene	<b>&lt;16.1</b>	ug/kg	56.8	16.1	1	11/14/17 15:31	11/15/17 09:07	108-88-3	
Trichloroethene	<b>&lt;9.6</b>	ug/kg	56.8	9.6	1	11/14/17 15:31	11/15/17 09:07	79-01-6	
Trichlorofluoromethane	<b>&lt;84.4</b>	ug/kg	227	84.4	1	11/14/17 15:31	11/15/17 09:07	75-69-4	
Vinyl acetate	<b>&lt;72.0</b>	ug/kg	568	72.0	1	11/14/17 15:31	11/15/17 09:07	108-05-4	
Vinyl chloride	<b>&lt;9.5</b>	ug/kg	22.7	9.5	1	11/14/17 15:31	11/15/17 09:07	75-01-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: UPRR\_Freeman

Pace Project No.: 10410064

**Sample: GSNE-S-4**      **Lab ID: 10410064001**      Collected: 11/02/17 10:15      Received: 11/07/17 10:00      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<10.2	ug/kg	56.8	10.2	1	11/14/17 15:31	11/15/17 09:07	156-59-2	
cis-1,3-Dichloropropene	<18.2	ug/kg	56.8	18.2	1	11/14/17 15:31	11/15/17 09:07	10061-01-5	
m&p-Xylene	<30.4	ug/kg	114	30.4	1	11/14/17 15:31	11/15/17 09:07	179601-23-1	
o-Xylene	<15.2	ug/kg	56.8	15.2	1	11/14/17 15:31	11/15/17 09:07	95-47-6	
trans-1,2-Dichloroethene	<23.2	ug/kg	56.8	23.2	1	11/14/17 15:31	11/15/17 09:07	156-60-5	
trans-1,3-Dichloropropene	<40.6	ug/kg	56.8	40.6	1	11/14/17 15:31	11/15/17 09:07	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-125		1	11/14/17 15:31	11/15/17 09:07	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1	11/14/17 15:31	11/15/17 09:07	2037-26-5	
4-Bromofluorobenzene (S)	98	%	75-125		1	11/14/17 15:31	11/15/17 09:07	460-00-4	

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## ANALYTICAL RESULTS

Project: UPRR\_Freeman

Pace Project No.: 10410064

Sample: **GSNE-W** Lab ID: **10410064002** Collected: 11/02/17 09:20 Received: 11/07/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	1.0	0.14	1		11/15/17 05:58	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		11/15/17 05:58	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		11/15/17 05:58	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		11/15/17 05:58	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		11/15/17 05:58	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		11/15/17 05:58	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		11/15/17 05:58	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		11/15/17 05:58	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		11/15/17 05:58	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		11/15/17 05:58	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		11/15/17 05:58	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		11/15/17 05:58	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		11/15/17 05:58	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		11/15/17 05:58	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		11/15/17 05:58	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		11/15/17 05:58	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		11/15/17 05:58	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		11/15/17 05:58	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		11/15/17 05:58	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		11/15/17 05:58	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		11/15/17 05:58	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		11/15/17 05:58	540-84-1	L2
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		11/15/17 05:58	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		11/15/17 05:58	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		11/15/17 05:58	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		11/15/17 05:58	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		11/15/17 05:58	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		11/15/17 05:58	108-10-1	
Acetone	44.1	ug/L	20.0	8.8	1		11/15/17 05:58	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		11/15/17 05:58	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		11/15/17 05:58	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		11/15/17 05:58	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		11/15/17 05:58	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		11/15/17 05:58	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		11/15/17 05:58	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		11/15/17 05:58	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		11/15/17 05:58	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		11/15/17 05:58	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		11/15/17 05:58	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		11/15/17 05:58	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		11/15/17 05:58	67-66-3	
Chloromethane	1.3J	ug/L	4.0	1.1	1		11/15/17 05:58	74-87-3	
Dibromochloromethane	<0.13	ug/L	1.0	0.13	1		11/15/17 05:58	124-48-1	

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## ANALYTICAL RESULTS

Project: UPRR\_Freeman

Pace Project No.: 10410064

Sample: **GSNE-W** Lab ID: **10410064002** Collected: 11/02/17 09:20 Received: 11/07/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		11/15/17 05:58	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		11/15/17 05:58	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		11/15/17 05:58	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		11/15/17 05:58	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		11/15/17 05:58	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		11/15/17 05:58	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		11/15/17 05:58	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		11/15/17 05:58	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		11/15/17 05:58	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		11/15/17 05:58	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		11/15/17 05:58	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		11/15/17 05:58	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		11/15/17 05:58	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		11/15/17 05:58	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		11/15/17 05:58	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		11/15/17 05:58	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		11/15/17 05:58	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		11/15/17 05:58	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		11/15/17 05:58	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		11/15/17 05:58	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		11/15/17 05:58	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		11/15/17 05:58	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		11/15/17 05:58	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		11/15/17 05:58	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		11/15/17 05:58	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		11/15/17 05:58	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		11/15/17 05:58	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		11/15/17 05:58	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		11/15/17 05:58	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		11/15/17 05:58	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		11/15/17 05:58	17060-07-0	
Toluene-d8 (S)	93	%	75-125		1		11/15/17 05:58	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		11/15/17 05:58	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: UPRR\_Freeman

Pace Project No.: 10410064

Sample: GSSW-S-5 Lab ID: 10410064003 Collected: 11/02/17 11:50 Received: 11/07/17 10:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight / %M by ASTM D2974</b>		Analytical Method: ASTM D2974							
Percent Moisture	<b>22.7</b>	%	0.10	0.10	1		11/08/17 12:14		
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
1,1,1-Trichloroethane	<b>&lt;16.0</b>	ug/kg	70.6	16.0	1	11/14/17 15:31	11/15/17 09:25	71-55-6	
1,1,2,2-Tetrachloroethane	<b>&lt;32.1</b>	ug/kg	70.6	32.1	1	11/14/17 15:31	11/15/17 09:25	79-34-5	
1,1,2-Trichloroethane	<b>&lt;19.2</b>	ug/kg	70.6	19.2	1	11/14/17 15:31	11/15/17 09:25	79-00-5	
1,1,2-Trichlorotrifluoroethane	<b>&lt;37.3</b>	ug/kg	282	37.3	1	11/14/17 15:31	11/15/17 09:25	76-13-1	
1,1-Dichloroethane	<b>&lt;18.4</b>	ug/kg	70.6	18.4	1	11/14/17 15:31	11/15/17 09:25	75-34-3	
1,1-Dichloroethene	<b>&lt;30.4</b>	ug/kg	70.6	30.4	1	11/14/17 15:31	11/15/17 09:25	75-35-4	
1,2,4-Trichlorobenzene	<b>&lt;20.2</b>	ug/kg	70.6	20.2	1	11/14/17 15:31	11/15/17 09:25	120-82-1	
1,2,4-Trimethylbenzene	<b>&lt;18.4</b>	ug/kg	70.6	18.4	1	11/14/17 15:31	11/15/17 09:25	95-63-6	
1,2-Dibromoethane (EDB)	<b>&lt;28.1</b>	ug/kg	70.6	28.1	1	11/14/17 15:31	11/15/17 09:25	106-93-4	
1,2-Dichlorobenzene	<b>&lt;15.4</b>	ug/kg	70.6	15.4	1	11/14/17 15:31	11/15/17 09:25	95-50-1	
1,2-Dichloroethane	<b>&lt;25.8</b>	ug/kg	70.6	25.8	1	11/14/17 15:31	11/15/17 09:25	107-06-2	
1,3,5-Trimethylbenzene	<b>&lt;13.7</b>	ug/kg	70.6	13.7	1	11/14/17 15:31	11/15/17 09:25	108-67-8	
1,3-Dichlorobenzene	<b>&lt;24.0</b>	ug/kg	70.6	24.0	1	11/14/17 15:31	11/15/17 09:25	541-73-1	
1,4-Dichlorobenzene	<b>&lt;25.7</b>	ug/kg	70.6	25.7	1	11/14/17 15:31	11/15/17 09:25	106-46-7	
2-Butanone (MEK)	<b>&lt;126</b>	ug/kg	353	126	1	11/14/17 15:31	11/15/17 09:25	78-93-3	
2-Hexanone	<b>&lt;90.9</b>	ug/kg	353	90.9	1	11/14/17 15:31	11/15/17 09:25	591-78-6	
4-Methyl-2-pentanone (MIBK)	<b>&lt;93.5</b>	ug/kg	353	93.5	1	11/14/17 15:31	11/15/17 09:25	108-10-1	
Acetone	<b>&lt;685</b>	ug/kg	1410	685	1	11/14/17 15:31	11/15/17 09:25	67-64-1	
Benzene	<b>&lt;10.4</b>	ug/kg	28.2	10.4	1	11/14/17 15:31	11/15/17 09:25	71-43-2	
Bromodichloromethane	<b>&lt;25.6</b>	ug/kg	70.6	25.6	1	11/14/17 15:31	11/15/17 09:25	75-27-4	
Bromoform	<b>&lt;51.0</b>	ug/kg	282	51.0	1	11/14/17 15:31	11/15/17 09:25	75-25-2	
Bromomethane	<b>&lt;75.3</b>	ug/kg	706	75.3	1	11/14/17 15:31	11/15/17 09:25	74-83-9	
Carbon tetrachloride	<b>&lt;28.2</b>	ug/kg	282	28.2	1	11/14/17 15:31	11/15/17 09:25	56-23-5	
Chlorobenzene	<b>&lt;21.0</b>	ug/kg	70.6	21.0	1	11/14/17 15:31	11/15/17 09:25	108-90-7	
Chloroethane	<b>&lt;108</b>	ug/kg	706	108	1	11/14/17 15:31	11/15/17 09:25	75-00-3	
Chloroform	<b>&lt;28.9</b>	ug/kg	70.6	28.9	1	11/14/17 15:31	11/15/17 09:25	67-66-3	
Chloromethane	<b>&lt;45.8</b>	ug/kg	282	45.8	1	11/14/17 15:31	11/15/17 09:25	74-87-3	
Dibromochloromethane	<b>&lt;70.6</b>	ug/kg	282	70.6	1	11/14/17 15:31	11/15/17 09:25	124-48-1	
Dichlorodifluoromethane	<b>&lt;110</b>	ug/kg	282	110	1	11/14/17 15:31	11/15/17 09:25	75-71-8	
Ethylbenzene	<b>&lt;20.5</b>	ug/kg	70.6	20.5	1	11/14/17 15:31	11/15/17 09:25	100-41-4	
Hexachloro-1,3-butadiene	<b>&lt;72.9</b>	ug/kg	353	72.9	1	11/14/17 15:31	11/15/17 09:25	87-68-3	
Methyl-tert-butyl ether	<b>&lt;22.0</b>	ug/kg	70.6	22.0	1	11/14/17 15:31	11/15/17 09:25	1634-04-4	
Methylene Chloride	<b>65.4J</b>	ug/kg	282	36.4	1	11/14/17 15:31	11/15/17 09:25	75-09-2	
Naphthalene	<b>&lt;62.1</b>	ug/kg	282	62.1	1	11/14/17 15:31	11/15/17 09:25	91-20-3	
Styrene	<b>&lt;19.1</b>	ug/kg	70.6	19.1	1	11/14/17 15:31	11/15/17 09:25	100-42-5	
Tetrachloroethene	<b>&lt;29.5</b>	ug/kg	70.6	29.5	1	11/14/17 15:31	11/15/17 09:25	127-18-4	
Tetrahydrofuran	<b>&lt;734</b>	ug/kg	2820	734	1	11/14/17 15:31	11/15/17 09:25	109-99-9	
Toluene	<b>&lt;20.1</b>	ug/kg	70.6	20.1	1	11/14/17 15:31	11/15/17 09:25	108-88-3	
Trichloroethene	<b>&lt;11.9</b>	ug/kg	70.6	11.9	1	11/14/17 15:31	11/15/17 09:25	79-01-6	
Trichlorofluoromethane	<b>&lt;105</b>	ug/kg	282	105	1	11/14/17 15:31	11/15/17 09:25	75-69-4	
Vinyl acetate	<b>&lt;89.5</b>	ug/kg	706	89.5	1	11/14/17 15:31	11/15/17 09:25	108-05-4	
Vinyl chloride	<b>&lt;11.9</b>	ug/kg	28.2	11.9	1	11/14/17 15:31	11/15/17 09:25	75-01-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: UPRR\_Freeman

Pace Project No.: 10410064

**Sample: GSSW-S-5**      **Lab ID: 10410064003**      Collected: 11/02/17 11:50      Received: 11/07/17 10:00      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV 5030 Med Level</b>		Analytical Method: EPA 8260B Preparation Method: EPA 5035/5030B							
cis-1,2-Dichloroethene	<12.7	ug/kg	70.6	12.7	1	11/14/17 15:31	11/15/17 09:25	156-59-2	
cis-1,3-Dichloropropene	<22.6	ug/kg	70.6	22.6	1	11/14/17 15:31	11/15/17 09:25	10061-01-5	
m&p-Xylene	<37.8	ug/kg	141	37.8	1	11/14/17 15:31	11/15/17 09:25	179601-23-1	
o-Xylene	<18.9	ug/kg	70.6	18.9	1	11/14/17 15:31	11/15/17 09:25	95-47-6	
trans-1,2-Dichloroethene	<28.8	ug/kg	70.6	28.8	1	11/14/17 15:31	11/15/17 09:25	156-60-5	
trans-1,3-Dichloropropene	<50.4	ug/kg	70.6	50.4	1	11/14/17 15:31	11/15/17 09:25	10061-02-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-125		1	11/14/17 15:31	11/15/17 09:25	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1	11/14/17 15:31	11/15/17 09:25	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1	11/14/17 15:31	11/15/17 09:25	460-00-4	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

QC Batch: 507166

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Associated Lab Samples: 10410064001, 10410064003

SAMPLE DUPLICATE: 2757017

Parameter	Units	10410063001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	19.8	17.8	11	30	

SAMPLE DUPLICATE: 2757219

Parameter	Units	10409897004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.2	12.9	2	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

QC Batch: 508499

Analysis Method: EPA 8260B

QC Batch Method: EPA 5035/5030B

Analysis Description: 8260B MSV 5030 Med Level

Associated Lab Samples: 10410064001, 10410064003

METHOD BLANK: 2763715

Matrix: Solid

Associated Lab Samples: 10410064001, 10410064003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/kg	<11.3	50.0	11.3	11/15/17 04:05	
1,1,2,2-Tetrachloroethane	ug/kg	<22.7	50.0	22.7	11/15/17 04:05	
1,1,2-Trichloroethane	ug/kg	<13.6	50.0	13.6	11/15/17 04:05	
1,1,2-Trichlorotrifluoroethane	ug/kg	<26.4	200	26.4	11/15/17 04:05	
1,1-Dichloroethane	ug/kg	<13.0	50.0	13.0	11/15/17 04:05	
1,1-Dichloroethene	ug/kg	<21.5	50.0	21.5	11/15/17 04:05	
1,2,4-Trichlorobenzene	ug/kg	<14.3	50.0	14.3	11/15/17 04:05	
1,2,4-Trimethylbenzene	ug/kg	<13.0	50.0	13.0	11/15/17 04:05	
1,2-Dibromoethane (EDB)	ug/kg	<19.9	50.0	19.9	11/15/17 04:05	
1,2-Dichlorobenzene	ug/kg	<10.9	50.0	10.9	11/15/17 04:05	
1,2-Dichloroethane	ug/kg	<18.3	50.0	18.3	11/15/17 04:05	
1,3,5-Trimethylbenzene	ug/kg	<9.7	50.0	9.7	11/15/17 04:05	
1,3-Dichlorobenzene	ug/kg	<17.0	50.0	17.0	11/15/17 04:05	
1,4-Dichlorobenzene	ug/kg	<18.2	50.0	18.2	11/15/17 04:05	
2-Butanone (MEK)	ug/kg	<89.5	250	89.5	11/15/17 04:05	
2-Hexanone	ug/kg	<64.4	250	64.4	11/15/17 04:05	
4-Methyl-2-pentanone (MIBK)	ug/kg	<66.2	250	66.2	11/15/17 04:05	
Acetone	ug/kg	<485	1000	485	11/15/17 04:05	
Benzene	ug/kg	<7.4	20.0	7.4	11/15/17 04:05	
Bromodichloromethane	ug/kg	<18.1	50.0	18.1	11/15/17 04:05	
Bromoform	ug/kg	<36.1	200	36.1	11/15/17 04:05	
Bromomethane	ug/kg	<53.3	500	53.3	11/15/17 04:05	
Carbon tetrachloride	ug/kg	<20.0	200	20.0	11/15/17 04:05	MN
Chlorobenzene	ug/kg	<14.9	50.0	14.9	11/15/17 04:05	
Chloroethane	ug/kg	<76.6	500	76.6	11/15/17 04:05	
Chloroform	ug/kg	<20.5	50.0	20.5	11/15/17 04:05	
Chloromethane	ug/kg	<32.4	200	32.4	11/15/17 04:05	
cis-1,2-Dichloroethene	ug/kg	<9.0	50.0	9.0	11/15/17 04:05	
cis-1,3-Dichloropropene	ug/kg	<16.0	50.0	16.0	11/15/17 04:05	
Dibromochloromethane	ug/kg	<50.0	200	50.0	11/15/17 04:05	MN
Dichlorodifluoromethane	ug/kg	<78.0	200	78.0	11/15/17 04:05	
Ethylbenzene	ug/kg	<14.5	50.0	14.5	11/15/17 04:05	
Hexachloro-1,3-butadiene	ug/kg	<51.6	250	51.6	11/15/17 04:05	
m&p-Xylene	ug/kg	<26.8	100	26.8	11/15/17 04:05	
Methyl-tert-butyl ether	ug/kg	<15.6	50.0	15.6	11/15/17 04:05	
Methylene Chloride	ug/kg	<25.8	200	25.8	11/15/17 04:05	
Naphthalene	ug/kg	<44.0	200	44.0	11/15/17 04:05	
o-Xylene	ug/kg	<13.4	50.0	13.4	11/15/17 04:05	
Styrene	ug/kg	<13.5	50.0	13.5	11/15/17 04:05	
Tetrachloroethene	ug/kg	<20.9	50.0	20.9	11/15/17 04:05	
Tetrahydrofuran	ug/kg	<520	2000	520	11/15/17 04:05	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

METHOD BLANK: 2763715

Matrix: Solid

Associated Lab Samples: 10410064001, 10410064003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Toluene	ug/kg	<14.2	50.0	14.2	11/15/17 04:05	
trans-1,2-Dichloroethene	ug/kg	<20.4	50.0	20.4	11/15/17 04:05	
trans-1,3-Dichloropropene	ug/kg	<35.7	50.0	35.7	11/15/17 04:05	
Trichloroethene	ug/kg	<8.5	50.0	8.5	11/15/17 04:05	
Trichlorofluoromethane	ug/kg	<74.3	200	74.3	11/15/17 04:05	
Vinyl acetate	ug/kg	<63.4	500	63.4	11/15/17 04:05	
Vinyl chloride	ug/kg	<8.4	20.0	8.4	11/15/17 04:05	
1,2-Dichloroethane-d4 (S)	%	100	75-125		11/15/17 04:05	
4-Bromofluorobenzene (S)	%	98	75-125		11/15/17 04:05	
Toluene-d8 (S)	%	98	75-125		11/15/17 04:05	

LABORATORY CONTROL SAMPLE & LCSD: 2763716

2763717

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	1000	863	883	86	88	55-125	2	20	
1,1,2,2-Tetrachloroethane	ug/kg	1000	940	988	94	99	66-125	5	20	
1,1,2-Trichloroethane	ug/kg	1000	876	979	88	98	65-125	11	20	
1,1,2-Trichlorotrifluoroethane	ug/kg	1000	804	798	80	80	57-125	1	20	
1,1-Dichloroethane	ug/kg	1000	851	872	85	87	60-125	2	20	
1,1-Dichloroethene	ug/kg	1000	823	819	82	82	56-125	0	20	
1,2,4-Trichlorobenzene	ug/kg	1000	897	953	90	95	61-125	6	20	
1,2,4-Trimethylbenzene	ug/kg	1000	905	937	90	94	66-125	4	20	
1,2-Dibromoethane (EDB)	ug/kg	1000	906	917	91	92	68-125	1	20	
1,2-Dichlorobenzene	ug/kg	1000	893	905	89	90	63-125	1	20	
1,2-Dichloroethane	ug/kg	1000	798	811	80	81	46-125	2	20	
1,3,5-Trimethylbenzene	ug/kg	1000	901	927	90	93	66-125	3	20	
1,3-Dichlorobenzene	ug/kg	1000	880	907	88	91	64-125	3	20	
1,4-Dichlorobenzene	ug/kg	1000	870	915	87	92	64-125	5	20	
2-Butanone (MEK)	ug/kg	5000	4580	4730	92	95	48-138	3	20	
2-Hexanone	ug/kg	5000	5000	5360	100	107	53-137	7	20	
4-Methyl-2-pentanone (MIBK)	ug/kg	5000	4840	5200	97	104	54-141	7	20	
Acetone	ug/kg	5000	5210	5660	104	113	68-125	8	20	
Benzene	ug/kg	1000	846	862	85	86	61-125	2	20	
Bromodichloromethane	ug/kg	1000	847	878	85	88	55-125	4	20	
Bromoform	ug/kg	1000	794	846	79	85	37-125	6	20	
Bromomethane	ug/kg	1000	768	796	77	80	47-125	4	20	
Carbon tetrachloride	ug/kg	1000	797	822	80	82	51-125	3	20	
Chlorobenzene	ug/kg	1000	859	894	86	89	63-125	4	20	
Chloroethane	ug/kg	1000	847	794	85	79	30-150	6	20	
Chloroform	ug/kg	1000	775	811	78	81	57-125	5	20	
Chloromethane	ug/kg	1000	742	667	74	67	45-125	11	20	
cis-1,2-Dichloroethene	ug/kg	1000	869	871	87	87	62-125	0	20	
cis-1,3-Dichloropropene	ug/kg	1000	775	801	78	80	59-125	3	20	
Dibromochloromethane	ug/kg	1000	784	821	78	82	51-125	5	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

LABORATORY CONTROL SAMPLE & LCSD: 2763716

2763717

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/kg	1000	687	632	69	63	30-125	8	20	
Ethylbenzene	ug/kg	1000	884	930	88	93	65-125	5	20	
Hexachloro-1,3-butadiene	ug/kg	1000	830	842	83	84	58-125	1	20	
m&p-Xylene	ug/kg	2000	1810	1900	90	95	67-125	5	20	
Methyl-tert-butyl ether	ug/kg	1000	860	882	86	88	60-125	3	20	
Methylene Chloride	ug/kg	1000	780	823	78	82	57-125	5	20	
Naphthalene	ug/kg	1000	1010	1050	101	105	61-125	4	20	
o-Xylene	ug/kg	1000	874	937	87	94	66-125	7	20	
Styrene	ug/kg	1000	915	968	92	97	66-125	6	20	
Tetrachloroethene	ug/kg	1000	923	951	92	95	65-125	3	20	
Tetrahydrofuran	ug/kg	10000	10400	11200	104	112	68-125	7	20	
Toluene	ug/kg	1000	844	902	84	90	67-125	7	20	
trans-1,2-Dichloroethene	ug/kg	1000	842	859	84	86	56-125	2	20	
trans-1,3-Dichloropropene	ug/kg	1000	798	829	80	83	63-125	4	20	
Trichloroethene	ug/kg	1000	838	885	84	89	63-125	5	20	
Trichlorofluoromethane	ug/kg	1000	900	866	90	87	35-141	4	20	
Vinyl acetate	ug/kg	1000	787	832	79	83	50-125	6	20	
Vinyl chloride	ug/kg	1000	896	828	90	83	53-125	8	20	
1,2-Dichloroethane-d4 (S)	%				99	99	75-125			
4-Bromofluorobenzene (S)	%				98	98	75-125			
Toluene-d8 (S)	%				98	98	75-125			

MATRIX SPIKE SAMPLE: 2763718

Parameter	Units	10410082006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/kg	ND	1450	1740	120	56-150	
1,1,2,2-Tetrachloroethane	ug/kg	ND	1450	1960	135	61-150	
1,1,2-Trichloroethane	ug/kg	ND	1450	1830	126	63-149	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	1450	1460	100	38-150	
1,1-Dichloroethane	ug/kg	ND	1450	1650	114	57-150	
1,1-Dichloroethene	ug/kg	ND	1450	1570	108	47-150	
1,2,4-Trichlorobenzene	ug/kg	ND	1450	1860	128	54-150	
1,2,4-Trimethylbenzene	ug/kg	ND	1450	1840	127	55-150	
1,2-Dibromoethane (EDB)	ug/kg	ND	1450	1840	127	60-149	
1,2-Dichlorobenzene	ug/kg	ND	1450	1770	122	61-148	
1,2-Dichloroethane	ug/kg	ND	1450	1590	109	51-143	
1,3,5-Trimethylbenzene	ug/kg	ND	1450	1830	126	61-150	
1,3-Dichlorobenzene	ug/kg	ND	1450	1790	123	57-150	
1,4-Dichlorobenzene	ug/kg	ND	1450	1760	121	58-148	
2-Butanone (MEK)	ug/kg	ND	7260	8720	120	55-150	
2-Hexanone	ug/kg	ND	7260	9870	136	60-150	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	7260	9800	135	61-150	
Acetone	ug/kg	ND	7260	9750	134	58-150	
Benzene	ug/kg	ND	1450	1670	115	54-150	
Bromodichloromethane	ug/kg	ND	1450	1840	127	54-149	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman  
Pace Project No.: 10410064

MATRIX SPIKE SAMPLE: 2763718		10410082006	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Bromoform	ug/kg	ND	1450	1670	115	47-143	
Bromomethane	ug/kg	ND	1450	1360	94	36-135	
Carbon tetrachloride	ug/kg	ND	1450	1550	107	51-150	
Chlorobenzene	ug/kg	ND	1450	1710	118	58-150	
Chloroethane	ug/kg	ND	1450	1590	109	30-150	
Chloroform	ug/kg	ND	1450	1550	106	56-145	
Chloromethane	ug/kg	ND	1450	1270	88	30-131	
cis-1,2-Dichloroethene	ug/kg	ND	1450	1690	117	59-150	
cis-1,3-Dichloropropene	ug/kg	ND	1450	1620	112	57-146	
Dibromochloromethane	ug/kg	ND	1450	1650	114	58-146	
Dichlorodifluoromethane	ug/kg	ND	1450	928	64	30-125	
Ethylbenzene	ug/kg	ND	1450	1790	124	58-150	
Hexachloro-1,3-butadiene	ug/kg	ND	1450	1770	122	49-150	
m&p-Xylene	ug/kg	ND	2900	3700	127	56-150	
Methyl-tert-butyl ether	ug/kg	ND	1450	1740	120	60-148	
Methylene Chloride	ug/kg	ND	1450	1540	103	52-146	
Naphthalene	ug/kg	ND	1450	2050	141	54-150	
o-Xylene	ug/kg	ND	1450	1820	125	57-150	
Styrene	ug/kg	ND	1450	1870	129	60-150	
Tetrachloroethene	ug/kg	ND	1450	1850	127	62-150	
Tetrahydrofuran	ug/kg	ND	14500	19800	136	57-149	
Toluene	ug/kg	ND	1450	1740	119	60-150	
trans-1,2-Dichloroethene	ug/kg	ND	1450	1650	114	55-150	
trans-1,3-Dichloropropene	ug/kg	ND	1450	1700	117	60-150	
Trichloroethene	ug/kg	ND	1450	1700	117	59-150	
Trichlorofluoromethane	ug/kg	ND	1450	1590	109	30-150	
Vinyl acetate	ug/kg	ND	1450	1680	116	30-150	
Vinyl chloride	ug/kg	ND	1450	1470	102	31-146	
1,2-Dichloroethane-d4 (S)	%				98	75-125	
4-Bromofluorobenzene (S)	%				98	75-125	
Toluene-d8 (S)	%				98	75-125	

SAMPLE DUPLICATE: 2763719

Parameter	Units	10410082007	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1-Trichloroethane	ug/kg	ND	<26.0		30	
1,1,2,2-Tetrachloroethane	ug/kg	ND	<52.2		30	
1,1,2-Trichloroethane	ug/kg	ND	<31.3		30	
1,1,2-Trichlorotrifluoroethane	ug/kg	ND	<60.7		30	
1,1-Dichloroethane	ug/kg	ND	<29.9		30	
1,1-Dichloroethene	ug/kg	ND	<49.5		30	
1,2,4-Trichlorobenzene	ug/kg	ND	<32.9		30	
1,2,4-Trimethylbenzene	ug/kg	ND	<29.9		30	
1,2-Dibromoethane (EDB)	ug/kg	ND	<45.8		30	
1,2-Dichlorobenzene	ug/kg	ND	<25.1		30	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

SAMPLE DUPLICATE: 2763719

Parameter	Units	10410082007 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane	ug/kg	ND	<42.1		30	
1,3,5-Trimethylbenzene	ug/kg	ND	<22.3		30	
1,3-Dichlorobenzene	ug/kg	ND	<39.1		30	
1,4-Dichlorobenzene	ug/kg	ND	<41.9		30	
2-Butanone (MEK)	ug/kg	ND	<206		30	
2-Hexanone	ug/kg	ND	<148		30	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	<152		30	
Acetone	ug/kg	ND	<1120		30	
Benzene	ug/kg	ND	<17.0		30	
Bromodichloromethane	ug/kg	ND	<41.7		30	
Bromoform	ug/kg	ND	<83.1		30	
Bromomethane	ug/kg	ND	<123		30	
Carbon tetrachloride	ug/kg	ND	<46.0		30	
Chlorobenzene	ug/kg	ND	<34.3		30	
Chloroethane	ug/kg	ND	<176		30	
Chloroform	ug/kg	ND	<47.2		30	
Chloromethane	ug/kg	ND	<74.6		30	
cis-1,2-Dichloroethene	ug/kg	ND	<20.7		30	
cis-1,3-Dichloropropene	ug/kg	ND	<36.8		30	
Dibromochloromethane	ug/kg	ND	<115		30	
Dichlorodifluoromethane	ug/kg	ND	<179		30	
Ethylbenzene	ug/kg	ND	<33.4		30	
Hexachloro-1,3-butadiene	ug/kg	ND	<119		30	
m&p-Xylene	ug/kg	ND	<61.7		30	
Methyl-tert-butyl ether	ug/kg	ND	<35.9		30	
Methylene Chloride	ug/kg	ND	59.5J		30	
Naphthalene	ug/kg	ND	<101		30	
o-Xylene	ug/kg	ND	32.2J		30	
Styrene	ug/kg	ND	<31.1		30	
Tetrachloroethene	ug/kg	ND	<48.1		30	
Tetrahydrofuran	ug/kg	ND	<1200		30	
Toluene	ug/kg	ND	38.6J		30	
trans-1,2-Dichloroethene	ug/kg	ND	<46.9		30	
trans-1,3-Dichloropropene	ug/kg	ND	<82.1		30	
Trichloroethene	ug/kg	ND	<19.5		30	
Trichlorofluoromethane	ug/kg	ND	<171		30	
Vinyl acetate	ug/kg	ND	<146		30	
Vinyl chloride	ug/kg	ND	<19.3		30	
1,2-Dichloroethane-d4 (S)	%	98	99	6		
4-Bromofluorobenzene (S)	%	98	95	0		
Toluene-d8 (S)	%	97	97	4		

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

QC Batch: 508465

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10410064002

METHOD BLANK: 2763540

Matrix: Water

Associated Lab Samples: 10410064002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	1.0	0.14	11/15/17 01:13	MN
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	11/15/17 01:13	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	11/15/17 01:13	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	11/15/17 01:13	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	11/15/17 01:13	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	11/15/17 01:13	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	11/15/17 01:13	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	11/15/17 01:13	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	11/15/17 01:13	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	11/15/17 01:13	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	11/15/17 01:13	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	11/15/17 01:13	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	11/15/17 01:13	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	11/15/17 01:13	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	11/15/17 01:13	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	11/15/17 01:13	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	11/15/17 01:13	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	11/15/17 01:13	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	11/15/17 01:13	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	11/15/17 01:13	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	11/15/17 01:13	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	11/15/17 01:13	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	11/15/17 01:13	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	11/15/17 01:13	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	11/15/17 01:13	
2-Hexanone	ug/L	<2.5	5.0	2.5	11/15/17 01:13	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	11/15/17 01:13	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	11/15/17 01:13	
Acetone	ug/L	<8.8	20.0	8.8	11/15/17 01:13	
Acrolein	ug/L	<4.8	10.0	4.8	11/15/17 01:13	
Acrylonitrile	ug/L	<4.9	10.0	4.9	11/15/17 01:13	
Benzene	ug/L	<0.13	0.50	0.13	11/15/17 01:13	
Bromobenzene	ug/L	<0.16	0.50	0.16	11/15/17 01:13	
Bromochloromethane	ug/L	<0.38	1.0	0.38	11/15/17 01:13	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	11/15/17 01:13	
Bromoform	ug/L	<1.0	4.0	1.0	11/15/17 01:13	
Bromomethane	ug/L	<1.5	4.0	1.5	11/15/17 01:13	
Carbon disulfide	ug/L	<0.37	1.0	0.37	11/15/17 01:13	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	11/15/17 01:13	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

METHOD BLANK: 2763540

Matrix: Water

Associated Lab Samples: 10410064002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
Chloroethane	ug/L	<0.44	1.0	0.44	11/15/17 01:13	
Chloroform	ug/L	0.48J	1.0	0.46	11/15/17 01:13	
Chloromethane	ug/L	<1.1	4.0	1.1	11/15/17 01:13	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	11/15/17 01:13	
cis-1,3-Dichloropropene	ug/L	<0.12	1.0	0.12	11/15/17 01:13	MN
Dibromochloromethane	ug/L	<0.13	1.0	0.13	11/15/17 01:13	MN
Dibromomethane	ug/L	<0.50	1.0	0.50	11/15/17 01:13	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	11/15/17 01:13	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	11/15/17 01:13	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	11/15/17 01:13	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	11/15/17 01:13	
Ethylbenzene	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	11/15/17 01:13	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
m&p-Xylene	ug/L	<0.24	1.0	0.24	11/15/17 01:13	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
Methylene Chloride	ug/L	<1.2	4.0	1.2	11/15/17 01:13	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	11/15/17 01:13	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	11/15/17 01:13	
Naphthalene	ug/L	<0.42	1.0	0.42	11/15/17 01:13	
o-Xylene	ug/L	<0.11	0.50	0.11	11/15/17 01:13	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	11/15/17 01:13	
Styrene	ug/L	<0.14	0.50	0.14	11/15/17 01:13	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	11/15/17 01:13	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	11/15/17 01:13	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	11/15/17 01:13	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	11/15/17 01:13	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	11/15/17 01:13	
Toluene	ug/L	<0.17	0.50	0.17	11/15/17 01:13	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	11/15/17 01:13	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	11/15/17 01:13	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	11/15/17 01:13	
Trichloroethene	ug/L	<0.18	0.40	0.18	11/15/17 01:13	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	11/15/17 01:13	
Vinyl acetate	ug/L	<1.5	10.0	1.5	11/15/17 01:13	
Vinyl chloride	ug/L	<0.096	0.20	0.096	11/15/17 01:13	
Xylene (Total)	ug/L	<0.24	1.5	0.24	11/15/17 01:13	
1,2-Dichloroethane-d4 (S)	%	97	75-137		11/15/17 01:13	
4-Bromofluorobenzene (S)	%	96	75-125		11/15/17 01:13	
Toluene-d8 (S)	%	93	75-125		11/15/17 01:13	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

LABORATORY CONTROL SAMPLE & LCSD: 2763541		2763542									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	20.2	18.8	101	94	75-136	7	30		
1,1,1-Trichloroethane	ug/L	20	18.3	16.6	91	83	75-129	10	30		
1,1,2,2-Tetrachloroethane	ug/L	20	22.2	21.3	111	107	71-138	4	30		
1,1,2-Trichloroethane	ug/L	20	20.3	18.9	102	94	75-125	7	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	16.9	14.8	85	74	69-126	13	30		
1,1-Dichloroethane	ug/L	20	18.1	16.3	90	82	75-125	10	30		
1,1-Dichloroethene	ug/L	20	17.0	15.3	85	77	75-125	10	30		
1,1-Dichloropropene	ug/L	20	16.7	16.0	83	80	75-125	4	30		
1,2,3-Trichlorobenzene	ug/L	20	20.4	21.7	102	109	75-125	6	30		
1,2,3-Trichloropropane	ug/L	20	22.6	20.7	113	104	75-125	8	30		
1,2,4-Trichlorobenzene	ug/L	20	20.2	19.4	101	97	75-125	4	30		
1,2,4-Trimethylbenzene	ug/L	20	20.3	18.8	101	94	75-125	8	30		
1,2-Dibromo-3-chloropropane	ug/L	50	56.9	56.8	114	114	71-130	0	30		
1,2-Dibromoethane (EDB)	ug/L	20	20.6	19.1	103	96	75-125	7	30		
1,2-Dichlorobenzene	ug/L	20	20.8	19.6	104	98	75-125	6	30		
1,2-Dichloroethane	ug/L	20	19.1	17.2	96	86	70-125	11	30		
1,2-Dichloroethene (Total)	ug/L	40	34.9	31.8	87	79	75-125	10	30		
1,2-Dichloropropane	ug/L	20	21.1	19.2	106	96	75-125	10	30		
1,3,5-Trimethylbenzene	ug/L	20	20.1	18.5	101	92	75-125	9	30		
1,3-Dichlorobenzene	ug/L	20	21.2	19.6	106	98	75-125	7	30		
1,3-Dichloropropane	ug/L	20	21.0	18.9	105	95	75-125	10	30		
1,4-Dichlorobenzene	ug/L	20	20.8	19.3	104	96	75-125	8	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	412	347	103	87	64-140	17	30		
2,2,4-Trimethylpentane	ug/L	20	15.2	13.3	76	67	68-125	13	30	L2	
2,2-Dichloropropane	ug/L	20	16.2	14.1	81	70	70-131	14	30		
2-Butanone (MEK)	ug/L	100	100	96.8	100	97	69-125	3	30		
2-Chlorotoluene	ug/L	20	21.5	20.0	107	100	75-125	7	30		
2-Hexanone	ug/L	100	119	112	119	112	73-129	7	30		
4-Chlorotoluene	ug/L	20	20.6	19.5	103	98	75-125	5	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	118	110	118	110	73-125	6	30		
Acetone	ug/L	100	110	99.3	110	99	66-126	10	30		
Acrolein	ug/L	200	263	248	132	124	56-150	6	30		
Acrylonitrile	ug/L	200	200	184	100	92	68-129	9	30		
Benzene	ug/L	20	19.7	17.8	98	89	75-125	10	30		
Bromobenzene	ug/L	20	20.2	19.3	101	96	75-125	5	30		
Bromochloromethane	ug/L	20	18.0	15.7	90	79	75-126	14	30		
Bromodichloromethane	ug/L	20	21.0	18.9	105	94	75-133	11	30		
Bromoform	ug/L	20	21.3	20.0	106	100	62-142	6	30		
Bromomethane	ug/L	20	18.4	17.1	92	86	34-143	7	30		
Carbon disulfide	ug/L	20	16.5	15.0	83	75	71-125	10	30		
Carbon tetrachloride	ug/L	20	18.4	16.6	92	83	71-145	10	30		
Chlorobenzene	ug/L	20	20.5	18.4	103	92	75-125	11	30		
Chloroethane	ug/L	20	16.8	15.4	84	77	75-125	9	30		
Chloroform	ug/L	20	18.2	16.7	91	83	75-125	9	30		
Chloromethane	ug/L	20	17.9	15.6	89	78	54-125	14	30		
cis-1,2-Dichloroethene	ug/L	20	17.5	15.8	87	79	75-125	10	30		
cis-1,3-Dichloropropene	ug/L	20	19.8	18.2	99	91	75-125	8	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

LABORATORY CONTROL SAMPLE & LCSD: 2763541		2763542								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	20.4	18.4	102	92	74-141	10	30	
Dibromomethane	ug/L	20	23.0	20.9	115	104	75-125	10	30	
Dichlorodifluoromethane	ug/L	20	16.1	14.1	81	70	59-130	13	30	
Dichlorofluoromethane	ug/L	20	18.2	16.2	91	81	75-125	12	30	
Diisopropyl ether	ug/L	20	17.4	16.0	87	80	69-125	9	30	
Ethyl-tert-butyl ether	ug/L	20	18.1	16.8	91	84	73-125	8	30	
Ethylbenzene	ug/L	20	21.1	19.0	106	95	75-125	10	30	
Hexachloro-1,3-butadiene	ug/L	20	21.2	19.1	106	95	75-131	11	30	
Isopropylbenzene (Cumene)	ug/L	20	20.6	18.9	103	94	75-125	9	30	
m&p-Xylene	ug/L	40	42.4	38.1	106	95	75-125	11	30	
Methyl-tert-butyl ether	ug/L	20	18.6	17.2	93	86	75-125	8	30	
Methylene Chloride	ug/L	20	17.1	15.7	85	78	73-125	9	30	
n-Butylbenzene	ug/L	20	20.1	18.2	101	91	75-125	10	30	
n-Propylbenzene	ug/L	20	20.7	18.6	104	93	75-125	11	30	
Naphthalene	ug/L	20	21.0	22.4	105	112	74-125	6	30	
o-Xylene	ug/L	20	20.8	19.0	104	95	75-125	9	30	
p-Isopropyltoluene	ug/L	20	20.7	17.7	103	88	75-125	15	30	
sec-Butylbenzene	ug/L	20	20.1	18.5	101	92	75-125	9	30	
Styrene	ug/L	20	20.6	19.0	103	95	75-125	8	30	
tert-Amylmethyl ether	ug/L	20	18.2	16.6	91	83	71-126	9	30	
tert-Butyl Alcohol	ug/L	200	209	193	104	97	69-131	8	30	
tert-Butylbenzene	ug/L	20	20.2	18.3	101	91	75-125	10	30	
Tetrachloroethene	ug/L	20	21.3	19.3	107	97	75-125	10	30	
Tetrahydrofuran	ug/L	200	219	199	109	99	65-127	10	30	
Toluene	ug/L	20	19.9	18.2	100	91	75-125	9	30	
trans-1,2-Dichloroethene	ug/L	20	17.5	15.9	87	80	75-125	9	30	
trans-1,3-Dichloropropene	ug/L	20	19.3	17.7	97	88	75-125	9	30	
trans-1,4-Dichloro-2-butene	ug/L	50	52.1	47.9	104	96	30-150	8	30	
Trichloroethene	ug/L	20	22.1	19.3	110	97	75-125	13	30	
Trichlorofluoromethane	ug/L	20	18.3	16.3	92	81	71-140	12	30	
Vinyl acetate	ug/L	20	18.6	17.2	93	86	68-137	8	30	
Vinyl chloride	ug/L	20	17.2	15.4	86	77	70-125	11	30	
Xylene (Total)	ug/L	60	63.2	57.0	105	95	75-125	10	30	
1,2-Dichloroethane-d4 (S)	%				94	93	75-137			
4-Bromofluorobenzene (S)	%				96	96	75-125			
Toluene-d8 (S)	%				96	94	75-125			

MATRIX SPIKE SAMPLE: 2763543		10410877001		Spike		MS		% Rec		Qualifiers
Parameter	Units	Result	Conc.	Result	% Rec	Result	% Rec	Limits		
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20.1	100	20.1	100	75-137		
1,1,1-Trichloroethane	ug/L	<0.15	20	18.9	95	18.9	95	75-139		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	22.3	111	22.3	111	60-142		
1,1,2-Trichloroethane	ug/L	<0.22	20	20.1	100	20.1	100	75-128		
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	19.4	97	19.4	97	62-150		

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

MATRIX SPIKE SAMPLE: 2763543		10410877001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	18.1	91	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	17.8	89	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	17.6	88	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	23.2	116	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	21.3	106	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	21.3	106	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20.1	101	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	59.1	118	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	19.9	100	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	21.0	105	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	18.7	93	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	35.5	89	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	20.4	102	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20.8	104	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	21.4	107	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	20.2	101	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	20.5	103	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	375	94	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	17.8	89	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	16.7	83	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	99.7	100	58-125	
2-Chlorotoluene	ug/L	<0.20	20	21.5	107	65-138	
2-Hexanone	ug/L	<2.5	100	115	115	61-134	
4-Chlorotoluene	ug/L	<0.13	20	20.6	103	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	114	114	61-130	
Acetone	ug/L	<8.8	100	127	127	51-140	
Acrolein	ug/L	<4.8	200	241	121	48-150	
Acrylonitrile	ug/L	<4.9	200	194	97	55-134	
Benzene	ug/L	<0.13	20	20.0	100	63-132	
Bromobenzene	ug/L	<0.16	20	20.4	102	67-138	
Bromochloromethane	ug/L	<0.38	20	17.3	86	66-138	
Bromodichloromethane	ug/L	<0.20	20	20.7	103	75-137	
Bromoform	ug/L	<1.0	20	21.2	106	65-129	
Bromomethane	ug/L	<1.5	20	20.5	103	41-150	
Carbon disulfide	ug/L	<0.37	20	17.6	88	72-132	
Carbon tetrachloride	ug/L	<0.20	20	19.2	96	75-150	
Chlorobenzene	ug/L	<0.14	20	20.6	103	73-127	
Chloroethane	ug/L	<0.44	20	18.4	92	74-138	
Chloroform	ug/L	<0.46	20	17.7	88	74-125	
Chloromethane	ug/L	<1.1	20	19.0	95	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	17.8	89	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	18.6	93	66-129	
Dibromochloromethane	ug/L	<0.13	20	19.8	99	75-133	
Dibromomethane	ug/L	<0.50	20	22.3	111	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	19.5	98	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	19.5	98	75-129	
Diisopropyl ether	ug/L	<0.12	20	17.4	87	62-128	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

MATRIX SPIKE SAMPLE: 2763543

Parameter	Units	10410877001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	17.6	88	63-132	
Ethylbenzene	ug/L	<0.14	20	21.0	105	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	22.5	112	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	21.2	106	70-136	
m&p-Xylene	ug/L	<0.24	40	42.5	106	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	18.4	92	72-125	
Methylene Chloride	ug/L	<1.2	20	17.2	85	60-132	
n-Butylbenzene	ug/L	<0.13	20	21.1	106	60-150	
n-Propylbenzene	ug/L	<0.12	20	20.6	103	63-142	
Naphthalene	ug/L	<0.42	20	23.5	117	67-125	
o-Xylene	ug/L	<0.11	20	20.4	102	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	20.2	101	64-146	
sec-Butylbenzene	ug/L	<0.12	20	20.9	105	67-144	
Styrene	ug/L	<0.14	20	20.9	105	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	17.7	89	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	201	101	56-146	
tert-Butylbenzene	ug/L	<0.15	20	20.6	103	68-135	
Tetrachloroethene	ug/L	<0.16	20	21.7	109	67-148	
Tetrahydrofuran	ug/L	<4.3	200	259	130	51-141	
Toluene	ug/L	<0.17	20	19.8	99	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	17.7	89	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	18.9	95	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	51.4	103	30-150	
Trichloroethene	ug/L	<0.18	20	22.0	110	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	21.1	105	75-150	
Vinyl acetate	ug/L	<1.5	20	15.8	79	49-143	
Vinyl chloride	ug/L	<0.096	20	19.7	98	75-133	
Xylene (Total)	ug/L	<0.24	60	62.8	105	63-142	
1,2-Dichloroethane-d4 (S)	%					93	75-137
4-Bromofluorobenzene (S)	%					97	75-125
Toluene-d8 (S)	%					94	75-125

SAMPLE DUPLICATE: 2763544

Parameter	Units	10410877002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

SAMPLE DUPLICATE: 2763544

Parameter	Units	10410877002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### QUALITY CONTROL DATA

Project: UPRR\_Freeman

Pace Project No.: 10410064

SAMPLE DUPLICATE: 2763544

Parameter	Units	10410877002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	97	97	0		
4-Bromofluorobenzene (S)	%	97	95	2		
Toluene-d8 (S)	%	91	92	1		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: UPRR\_Freeman

Pace Project No.: 10410064

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: UPRR\_Freeman

Pace Project No.: 10410064

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV 5030 Med Level	Solid	SW-846 8260B	SW-846 5030B
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: UPRR\_Freeman

Pace Project No.: 10410064

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10410064001	GSNE-S-4	ASTM D2974	507166		
10410064003	GSSW-S-5	ASTM D2974	507166		
10410064001	GSNE-S-4	EPA 5035/5030B	508499	EPA 8260B	508734
10410064003	GSSW-S-5	EPA 5035/5030B	508499	EPA 8260B	508734
10410064002	GSNE-W	EPA 8260B	508465		

### REPORT OF LABORATORY ANALYSIS

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### CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10410064

Page: 1 of 1  
2134804

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <b>OLYM HILL</b>		Report To: <b>MARK OCHSNER, DAVID HODSON</b>		Attention: <b>ANNE THERIAULT</b>	
Address: <b>111 W RIVERSIDE AVE SUITE 500</b>		Copy To: <b>STEVE DEMUS</b>		Company Name: <b>UPRR</b>	
<b>SPOKANE WA</b>				Address: <b>1400 W 52 AVE DENVER CO 80221</b>	
Email To:		Purchase Order No.:		Pace Quote Reference:	
Phone:		Project Name: <b>UPRR FREEMAN</b>		Pace Project Manager: <b>JENNIFER CROSS</b>	
Fax:		Project Number:		Pace Profile #:	
Requested Due Date/TAT: <b>STANDARD</b>				Site Location	
				STATE:	

<b>REGULATORY AGENCY</b>		
<input type="checkbox"/> NPDES	<input type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER

ITEM #	Section D Required Client Information  <b>SAMPLE ID</b> (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.						
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other									
					DATE	TIME	DATE	TIME																			
1	GSNE-S-4	DW	SL		11/21/17	1015			3	1																	
2	GSNE-W	WT	WT		11/21/17	920			3																		001
3	GSSW-S-5	SL	SL		11/21/17	1150			3	1																	002
4	TRIP BLANK	WT	WT		-	-			2																		003
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
TRIP BLANKS NOT PROVIDED	<i>[Signature]</i>	11/21/17	1700	FED EX	11/21/17	1700	
				<i>[Signature]</i>	11/17/17	1000	50 7 7 7


ORIGINAL	<b>SAMPLER NAME AND SIGNATURE</b>		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER: <i>REBEKAH GROSS</i>					
	SIGNATURE of SAMPLER: <i>[Signature]</i>					
		DATE Signed (MM/DD/YY): <i>11-27-17</i>				

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** CH2M Hill **Project #:** \_\_\_\_\_

WO#: 10410064



10410064

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

**Tracking Number:** 72227398698

**Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No  
**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ **Temp Blank?**  Yes  No  
**Thermometer**  151401163  687A9155100842 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 5.4 **Cooler Temp Corrected (°C):** 5.0 **Biological Tissue Frozen?**  Yes  No  N/A  
 Temp should be above freezing to 5°C **Correction Factor:** 0.4 **Date and Initials of Person Examining Contents:** 6/11/17

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>SL&amp;WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 3 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?**  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1730</u>	Temp: <u>5.4</u>	Corrected Temp: <u>5.0</u>
Time: <u>1740</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** JENNI GROSS **Date:** 11/08/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)



December 20, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

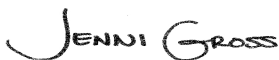
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414217

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414217001	MW13S-GW-121117	Water	12/11/17 11:25	12/13/17 09:50
10414217002	MARLOWW20-GW-121117	Water	12/11/17 14:40	12/13/17 09:50
10414217003	MW22S-GW-121217	Water	12/12/17 11:00	12/13/17 09:50
10414217004	SG01-121217	Water	12/12/17 13:50	12/13/17 09:50
10414217005	SG02-121217	Water	12/12/17 14:00	12/13/17 09:50
10414217006	TRIP BLANK	Water	12/12/17 00:00	12/13/17 09:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414217001	MW13S-GW-121117	EPA 8260B	DJB	83	PASI-M
10414217002	MARLOWW20-GW-121117	EPA 8260B	DJB	83	PASI-M
10414217003	MW22S-GW-121217	EPA 8260B	DJB	83	PASI-M
10414217004	SG01-121217	EPA 8260B	DJB	83	PASI-M
10414217005	SG02-121217	EPA 8260B	DJB	83	PASI-M
10414217006	TRIP BLANK	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414217002</b>	<b>MARLOWW20-GW-121117</b>					
EPA 8260B	1,2,4-Trimethylbenzene	0.53	ug/L	0.50	12/16/17 03:28	
EPA 8260B	1,3,5-Trimethylbenzene	0.33J	ug/L	0.50	12/16/17 03:28	
EPA 8260B	Benzene	0.13J	ug/L	0.50	12/16/17 03:28	
<b>10414217003</b>	<b>MW22S-GW-121217</b>					
EPA 8260B	Carbon tetrachloride	2.2	ug/L	0.50	12/16/17 03:52	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 20, 2017

### General Information:

6 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 513905

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414415001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2794626)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2794627)
  - Acetone
  - Carbon tetrachloride
  - Tetrahydrofuran

QC Batch: 513906

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414412001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2794630)
  - Acetone

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 20, 2017

QC Batch: 513906

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414412001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Carbon tetrachloride
- MSD (Lab ID: 2794631)
- Acetone
- Carbon tetrachloride
- Chloroform

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: MW13S-GW-121117**      **Lab ID: 10414217001**      Collected: 12/11/17 11:25      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/15/17 17:42	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/15/17 17:42	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/15/17 17:42	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/15/17 17:42	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/15/17 17:42	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/15/17 17:42	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/15/17 17:42	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/15/17 17:42	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/15/17 17:42	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/15/17 17:42	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/15/17 17:42	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/15/17 17:42	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/15/17 17:42	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/15/17 17:42	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/15/17 17:42	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/15/17 17:42	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/15/17 17:42	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/15/17 17:42	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/15/17 17:42	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/15/17 17:42	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/15/17 17:42	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/15/17 17:42	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/15/17 17:42	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/15/17 17:42	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/15/17 17:42	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/15/17 17:42	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/15/17 17:42	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/15/17 17:42	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/15/17 17:42	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/15/17 17:42	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/15/17 17:42	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/15/17 17:42	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/15/17 17:42	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/15/17 17:42	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/15/17 17:42	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/15/17 17:42	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/15/17 17:42	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/15/17 17:42	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: MW13S-GW-121117**      **Lab ID: 10414217001**      Collected: 12/11/17 11:25      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/15/17 17:42	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/15/17 17:42	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/15/17 17:42	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/15/17 17:42	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/15/17 17:42	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/15/17 17:42	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/15/17 17:42	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/15/17 17:42	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/15/17 17:42	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/15/17 17:42	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/15/17 17:42	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/15/17 17:42	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/15/17 17:42	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/15/17 17:42	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/15/17 17:42	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/15/17 17:42	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/15/17 17:42	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/15/17 17:42	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/15/17 17:42	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/15/17 17:42	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/15/17 17:42	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/15/17 17:42	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/15/17 17:42	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/15/17 17:42	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/15/17 17:42	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/15/17 17:42	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/15/17 17:42	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	94	%	75-137		1		12/15/17 17:42	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		12/15/17 17:42	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/15/17 17:42	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Sample: **MARLOWW20-GW-121117** Lab ID: **10414217002** Collected: 12/11/17 14:40 Received: 12/13/17 09:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 03:28	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 03:28	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 03:28	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 03:28	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:28	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:28	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 03:28	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:28	120-82-1	
1,2,4-Trimethylbenzene	0.53	ug/L	0.50	0.098	1		12/16/17 03:28	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 03:28	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 03:28	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 03:28	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 03:28	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 03:28	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 03:28	78-87-5	
1,3,5-Trimethylbenzene	0.33J	ug/L	0.50	0.18	1		12/16/17 03:28	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:28	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:28	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 03:28	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 03:28	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 03:28	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 03:28	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 03:28	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 03:28	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 03:28	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:28	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 03:28	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 03:28	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 03:28	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 03:28	107-13-1	
Benzene	0.13J	ug/L	0.50	0.13	1		12/16/17 03:28	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:28	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 03:28	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 03:28	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 03:28	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 03:28	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/16/17 03:28	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/16/17 03:28	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 03:28	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/16/17 03:28	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 03:28	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:28	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: MARLOWW20-GW-121117**    **Lab ID: 10414217002**    Collected: 12/11/17 14:40    Received: 12/13/17 09:50    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 03:28	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 03:28	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 03:28	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 03:28	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 03:28	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 03:28	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 03:28	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 03:28	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:28	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 03:28	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 03:28	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 03:28	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:28	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 03:28	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 03:28	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 03:28	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 03:28	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:28	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 03:28	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:28	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:28	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 03:28	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:28	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 03:28	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 03:28	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 03:28	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 03:28	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:28	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 03:28	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		12/16/17 03:28	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/16/17 03:28	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		1		12/16/17 03:28	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414217

**Sample: MW22S-GW-121217**      **Lab ID: 10414217003**      Collected: 12/12/17 11:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 03:52	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 03:52	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 03:52	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 03:52	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:52	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:52	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 03:52	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:52	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/16/17 03:52	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 03:52	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 03:52	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 03:52	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 03:52	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 03:52	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 03:52	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:52	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:52	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 03:52	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 03:52	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 03:52	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 03:52	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 03:52	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 03:52	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 03:52	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 03:52	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 03:52	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 03:52	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 03:52	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:52	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 03:52	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 03:52	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 03:52	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 03:52	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/16/17 03:52	75-15-0	
Carbon tetrachloride	2.2	ug/L	0.50	0.20	1		12/16/17 03:52	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 03:52	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/16/17 03:52	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 03:52	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample:** MW22S-GW-121217      **Lab ID:** 10414217003      Collected: 12/12/17 11:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 03:52	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 03:52	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 03:52	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 03:52	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 03:52	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 03:52	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 03:52	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:52	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 03:52	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 03:52	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 03:52	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 03:52	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 03:52	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 03:52	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 03:52	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:52	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 03:52	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:52	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:52	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 03:52	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:52	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 03:52	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 03:52	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 03:52	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 03:52	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:52	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 03:52	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		12/16/17 03:52	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/16/17 03:52	2037-26-5	
4-Bromofluorobenzene (S)	90	%	75-125		1		12/16/17 03:52	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: SG01-121217**      **Lab ID: 10414217004**      Collected: 12/12/17 13:50      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 04:15	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 04:15	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 04:15	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 04:15	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:15	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:15	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 04:15	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:15	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/16/17 04:15	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 04:15	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 04:15	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 04:15	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 04:15	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 04:15	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 04:15	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:15	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 04:15	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 04:15	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 04:15	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 04:15	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 04:15	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 04:15	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 04:15	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 04:15	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 04:15	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 04:15	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 04:15	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 04:15	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 04:15	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 04:15	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 04:15	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 04:15	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 04:15	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/16/17 04:15	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/16/17 04:15	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 04:15	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/16/17 04:15	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 04:15	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: SG01-121217**      **Lab ID: 10414217004**      Collected: 12/12/17 13:50      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 04:15	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 04:15	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 04:15	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 04:15	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 04:15	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 04:15	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 04:15	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 04:15	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 04:15	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 04:15	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 04:15	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 04:15	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 04:15	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 04:15	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 04:15	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 04:15	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 04:15	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 04:15	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 04:15	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 04:15	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 04:15	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 04:15	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 04:15	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 04:15	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 04:15	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:15	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 04:15	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		12/16/17 04:15	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		12/16/17 04:15	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		12/16/17 04:15	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: SG02-121217**      **Lab ID: 10414217005**      Collected: 12/12/17 14:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 04:39	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 04:39	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 04:39	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 04:39	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:39	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:39	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 04:39	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:39	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/16/17 04:39	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 04:39	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 04:39	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 04:39	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 04:39	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 04:39	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 04:39	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 04:39	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 04:39	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 04:39	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 04:39	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 04:39	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 04:39	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 04:39	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 04:39	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 04:39	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 04:39	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 04:39	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 04:39	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 04:39	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 04:39	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 04:39	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 04:39	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 04:39	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 04:39	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/16/17 04:39	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/16/17 04:39	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 04:39	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/16/17 04:39	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 04:39	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: SG02-121217**      **Lab ID: 10414217005**      Collected: 12/12/17 14:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 04:39	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 04:39	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 04:39	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 04:39	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 04:39	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 04:39	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 04:39	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 04:39	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 04:39	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 04:39	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 04:39	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 04:39	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 04:39	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 04:39	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 04:39	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 04:39	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 04:39	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 04:39	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 04:39	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 04:39	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 04:39	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 04:39	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 04:39	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 04:39	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 04:39	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 04:39	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 04:39	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		12/16/17 04:39	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		12/16/17 04:39	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/16/17 04:39	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414217

**Sample: TRIP BLANK**      **Lab ID: 10414217006**      Collected: 12/12/17 00:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 02:18	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 02:18	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 02:18	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 02:18	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 02:18	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 02:18	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 02:18	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 02:18	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/16/17 02:18	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 02:18	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 02:18	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 02:18	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 02:18	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 02:18	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 02:18	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 02:18	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 02:18	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 02:18	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 02:18	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 02:18	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 02:18	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 02:18	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 02:18	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 02:18	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 02:18	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 02:18	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 02:18	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 02:18	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 02:18	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 02:18	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 02:18	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 02:18	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 02:18	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/16/17 02:18	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/16/17 02:18	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 02:18	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/16/17 02:18	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 02:18	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

**Sample: TRIP BLANK**      **Lab ID: 10414217006**      Collected: 12/12/17 00:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 02:18	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 02:18	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 02:18	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 02:18	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 02:18	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 02:18	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 02:18	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 02:18	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 02:18	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 02:18	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 02:18	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 02:18	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 02:18	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 02:18	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 02:18	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 02:18	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 02:18	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 02:18	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 02:18	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 02:18	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 02:18	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 02:18	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 02:18	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 02:18	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 02:18	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 02:18	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 02:18	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		12/16/17 02:18	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		12/16/17 02:18	2037-26-5	
4-Bromofluorobenzene (S)	92	%	75-125		1		12/16/17 02:18	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

QC Batch: 513905

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10414217001

METHOD BLANK: 2794624

Matrix: Water

Associated Lab Samples: 10414217001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/15/17 13:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/15/17 13:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/15/17 13:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/15/17 13:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/15/17 13:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/15/17 13:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/15/17 13:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/15/17 13:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/15/17 13:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/15/17 13:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/15/17 13:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/15/17 13:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/15/17 13:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/15/17 13:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/15/17 13:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/15/17 13:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/15/17 13:24	
Acetone	ug/L	<8.8	20.0	8.8	12/15/17 13:24	
Acrolein	ug/L	<4.8	10.0	4.8	12/15/17 13:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/15/17 13:24	
Benzene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/15/17 13:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
Bromoform	ug/L	<1.0	4.0	1.0	12/15/17 13:24	
Bromomethane	ug/L	<1.5	4.0	1.5	12/15/17 13:24	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/15/17 13:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/15/17 13:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

METHOD BLANK: 2794624

Matrix: Water

Associated Lab Samples: 10414217001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Chloroethane	ug/L	<0.44	1.0	0.44	12/15/17 13:24	
Chloroform	ug/L	<0.46	1.0	0.46	12/15/17 13:24	
Chloromethane	ug/L	<1.1	4.0	1.1	12/15/17 13:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/15/17 13:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/15/17 13:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/15/17 13:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/15/17 13:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/15/17 13:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/15/17 13:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/15/17 13:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Naphthalene	ug/L	<0.42	1.0	0.42	12/15/17 13:24	
o-Xylene	ug/L	<0.11	0.50	0.11	12/15/17 13:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Styrene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/15/17 13:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/15/17 13:24	
Toluene	ug/L	<0.17	0.50	0.17	12/15/17 13:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/15/17 13:24	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/15/17 13:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/15/17 13:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/15/17 13:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/15/17 13:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/15/17 13:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		12/15/17 13:24	
4-Bromofluorobenzene (S)	%	96	75-125		12/15/17 13:24	
Toluene-d8 (S)	%	98	75-125		12/15/17 13:24	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

LABORATORY CONTROL SAMPLE: 2794625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	110	75-136	
1,1,1-Trichloroethane	ug/L	20	20.5	102	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	17.2	86	71-138	
1,1,2-Trichloroethane	ug/L	20	19.6	98	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.1	90	69-126	
1,1-Dichloroethane	ug/L	20	19.1	96	75-125	
1,1-Dichloroethene	ug/L	20	18.7	93	75-125	
1,1-Dichloropropene	ug/L	20	18.7	93	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.0	100	75-125	
1,2,3-Trichloropropane	ug/L	20	20.7	103	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.3	96	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.1	95	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	47.6	95	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	18.7	94	75-125	
1,2-Dichlorobenzene	ug/L	20	20.7	103	75-125	
1,2-Dichloroethane	ug/L	20	19.8	99	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	94	75-125	
1,2-Dichloropropane	ug/L	20	17.2	86	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.8	99	75-125	
1,3-Dichlorobenzene	ug/L	20	20.6	103	75-125	
1,3-Dichloropropane	ug/L	20	19.2	96	75-125	
1,4-Dichlorobenzene	ug/L	20	21.2	106	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	362	91	64-140	
2,2,4-Trimethylpentane	ug/L	20	18.5	93	68-125	
2,2-Dichloropropane	ug/L	20	20.3	102	70-131	
2-Butanone (MEK)	ug/L	100	91.8	92	69-125	
2-Chlorotoluene	ug/L	20	19.6	98	75-125	
2-Hexanone	ug/L	100	94.8	95	73-129	
4-Chlorotoluene	ug/L	20	18.7	93	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.6	98	73-125	
Acetone	ug/L	100	119	119	66-126	
Acrolein	ug/L	200	183	92	56-150	
Acrylonitrile	ug/L	200	180	90	68-129	
Benzene	ug/L	20	19.1	95	75-125	
Bromobenzene	ug/L	20	21.1	105	75-125	
Bromochloromethane	ug/L	20	19.9	100	75-126	
Bromodichloromethane	ug/L	20	18.0	90	75-133	
Bromoform	ug/L	20	19.8	99	62-142	
Bromomethane	ug/L	20	16.8	84	34-143	
Carbon disulfide	ug/L	20	16.5	83	71-125	
Carbon tetrachloride	ug/L	20	21.4	107	71-145	
Chlorobenzene	ug/L	20	20.8	104	75-125	
Chloroethane	ug/L	20	19.5	97	75-125	
Chloroform	ug/L	20	19.1	96	75-125	
Chloromethane	ug/L	20	16.7	84	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.5	92	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.0	90	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

LABORATORY CONTROL SAMPLE: 2794625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	20.8	104	74-141	
Dibromomethane	ug/L	20	19.4	97	75-125	
Dichlorodifluoromethane	ug/L	20	20.2	101	59-130	
Dichlorofluoromethane	ug/L	20	19.5	97	75-125	
Diisopropyl ether	ug/L	20	18.4	92	69-125	
Ethyl-tert-butyl ether	ug/L	20	17.9	90	73-125	
Ethylbenzene	ug/L	20	20.6	103	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.1	111	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.5	97	75-125	
m&p-Xylene	ug/L	40	42.9	107	75-125	
Methyl-tert-butyl ether	ug/L	20	19.0	95	75-125	
Methylene Chloride	ug/L	20	17.0	85	73-125	
n-Butylbenzene	ug/L	20	19.0	95	75-125	
n-Propylbenzene	ug/L	20	18.6	93	75-125	
Naphthalene	ug/L	20	18.1	90	74-125	
o-Xylene	ug/L	20	19.3	96	75-125	
p-Isopropyltoluene	ug/L	20	20.0	100	75-125	
sec-Butylbenzene	ug/L	20	19.6	98	75-125	
Styrene	ug/L	20	19.3	97	75-125	
tert-Amylmethyl ether	ug/L	20	19.5	98	71-126	
tert-Butyl Alcohol	ug/L	200	221	110	69-131	
tert-Butylbenzene	ug/L	20	19.4	97	75-125	
Tetrachloroethene	ug/L	20	19.5	97	75-125	
Tetrahydrofuran	ug/L	200	240	120	65-127	
Toluene	ug/L	20	20.1	100	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	42.3	85	30-150	
Trichloroethene	ug/L	20	20.9	105	75-125	
Trichlorofluoromethane	ug/L	20	21.3	106	71-140	
Vinyl acetate	ug/L	20	17.0	85	68-137	
Vinyl chloride	ug/L	20	18.2	91	70-125	
Xylene (Total)	ug/L	60	62.2	104	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			91	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794626 2794627

Parameter	Units	10414415001		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.29	40	40	40	41.6	42.8	104	107	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.30	40	40	40	41.5	43.0	104	108	75-139	4	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	40	40	40	33.4	35.7	84	89	60-142	6	30	
1,1,2-Trichloroethane	ug/L	<0.44	40	40	40	36.9	37.6	92	94	75-128	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Parameter	Units	10414415001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec							
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794626 2794627																
1,1,2-Trichlorotrifluoroethane	ug/L	<0.55	40	40	40.7	41.4	102	103	62-150	2	30					
1,1-Dichloroethane	ug/L	<0.29	40	40	38.1	38.7	95	97	70-129	2	30					
1,1-Dichloroethene	ug/L	<0.36	40	40	38.2	38.1	95	95	67-141	0	30					
1,1-Dichloropropene	ug/L	<0.35	40	40	38.0	38.4	95	96	64-144	1	30					
1,2,3-Trichlorobenzene	ug/L	<0.29	40	40	42.0	44.8	105	112	66-139	7	30					
1,2,3-Trichloropropane	ug/L	<1.3	40	40	40.0	40.2	100	100	69-134	1	30					
1,2,4-Trichlorobenzene	ug/L	<0.36	40	40	38.4	40.9	96	102	65-138	6	30					
1,2,4-Trimethylbenzene	ug/L	<0.20	40	40	37.7	39.5	94	99	65-143	4	30					
1,2-Dibromo-3-chloropropane	ug/L	<2.1	100	100	93.4	101	93	101	61-134	8	30					
1,2-Dibromoethane (EDB)	ug/L	<0.34	40	40	35.5	36.0	89	90	74-129	1	30					
1,2-Dichlorobenzene	ug/L	<0.42	40	40	38.6	41.4	96	103	68-135	7	30					
1,2-Dichloroethane	ug/L	<0.30	40	40	37.5	38.2	94	96	73-125	2	30					
1,2-Dichloroethene (Total)	ug/L	<0.82	80	80	74.1	75.8	93	95	69-134	2	30					
1,2-Dichloropropane	ug/L	<1.2	40	40	33.0	34.2	82	86	64-130	4	30					
1,3,5-Trimethylbenzene	ug/L	<0.36	40	40	38.6	40.6	97	102	64-146	5	30					
1,3-Dichlorobenzene	ug/L	<0.32	40	40	39.3	41.8	98	104	69-135	6	30					
1,3-Dichloropropane	ug/L	<0.26	40	40	35.6	37.3	89	93	67-128	5	30					
1,4-Dichlorobenzene	ug/L	<0.21	40	40	40.2	42.4	101	106	66-134	5	30					
1,4-Dioxane (p-Dioxane)	ug/L	<45.2	800	800	699	697	87	87	58-140	0	30					
2,2,4-Trimethylpentane	ug/L	<2.6	40	40	40.2	41.1	101	103	48-150	2	30					
2,2-Dichloropropane	ug/L	<0.79	40	40	40.4	41.9	101	105	50-150	4	30					
2-Butanone (MEK)	ug/L	<4.8	200	200	183	181	92	91	58-125	1	30					
2-Chlorotoluene	ug/L	<0.41	40	40	39.0	40.5	97	101	65-138	4	30					
2-Hexanone	ug/L	<5.0	200	200	180	186	90	93	61-134	3	30					
4-Chlorotoluene	ug/L	<0.26	40	40	35.4	37.7	89	94	68-135	6	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<1.1	200	200	186	189	93	95	61-130	2	30					
Acetone	ug/L	<17.7	200	200	296	325	148	163	51-140	9	30	M1				
Acrolein	ug/L	<9.7	400	400	407	407	102	102	48-150	0	30					
Acrylonitrile	ug/L	<9.8	400	400	343	350	86	87	55-134	2	30					
Benzene	ug/L	<0.25	40	40	37.8	38.8	95	97	63-132	2	30					
Bromobenzene	ug/L	<0.31	40	40	39.5	42.6	99	106	67-138	8	30					
Bromochloromethane	ug/L	<0.76	40	40	37.7	38.6	94	97	66-138	2	30					
Bromodichloromethane	ug/L	<0.40	40	40	35.1	34.7	88	87	75-137	1	30					
Bromoform	ug/L	<2.1	40	40	38.8	39.6	97	99	65-129	2	30					
Bromomethane	ug/L	<3.1	40	40	36.5	38.9	91	97	41-150	6	30					
Carbon disulfide	ug/L	1.5J	40	40	34.0	35.8	81	86	72-132	5	30					
Carbon tetrachloride	ug/L	289	40	40	323	313	87	60	75-150	3	30	M1				
Chlorobenzene	ug/L	<0.27	40	40	40.0	40.2	100	100	73-127	0	30					
Chloroethane	ug/L	<0.88	40	40	39.1	38.6	98	96	74-138	1	30					
Chloroform	ug/L	10.2	40	40	46.8	46.8	92	92	74-125	0	30					
Chloromethane	ug/L	<2.2	40	40	33.2	32.8	83	82	58-129	1	30					
cis-1,2-Dichloroethene	ug/L	<0.40	40	40	35.4	36.3	88	91	63-135	3	30					
cis-1,3-Dichloropropene	ug/L	<0.23	40	40	33.1	33.7	83	84	66-129	2	30					
Dibromochloromethane	ug/L	<0.27	40	40	40.8	40.9	102	102	75-133	0	30					

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Parameter	Units	2794626		2794627		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414415001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<1.0	40	40	37.3	36.8	93	92	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.63	40	40	45.8	45.4	115	114	72-150	1	30		
Dichlorofluoromethane	ug/L	<0.77	40	40	39.8	38.5	99	96	75-129	3	30		
Diisopropyl ether	ug/L	<0.25	40	40	36.1	36.6	90	91	62-128	1	30		
Ethyl-tert-butyl ether	ug/L	<0.26	40	40	34.9	35.9	87	90	63-132	3	30		
Ethylbenzene	ug/L	<0.27	40	40	39.4	41.6	98	104	72-130	6	30		
Hexachloro-1,3-butadiene	ug/L	<0.96	40	40	42.6	47.7	107	119	71-150	11	30		
Isopropylbenzene (Cumene)	ug/L	<0.28	40	40	38.3	39.5	96	99	70-136	3	30		
m&p-Xylene	ug/L	<0.49	80	80	80.2	84.7	100	106	64-142	5	30		
Methyl-tert-butyl ether	ug/L	<0.29	40	40	36.8	37.9	92	95	72-125	3	30		
Methylene Chloride	ug/L	<2.3	40	40	32.7	33.2	82	83	60-132	1	30		
n-Butylbenzene	ug/L	<0.27	40	40	38.0	40.6	95	101	60-150	7	30		
n-Propylbenzene	ug/L	<0.25	40	40	36.3	38.7	91	97	63-142	6	30		
Naphthalene	ug/L	<0.84	40	40	37.3	39.6	93	99	67-125	6	30		
o-Xylene	ug/L	<0.22	40	40	38.4	39.7	96	99	60-143	3	30		
p-Isopropyltoluene	ug/L	<0.28	40	40	38.2	40.6	96	101	64-146	6	30		
sec-Butylbenzene	ug/L	<0.25	40	40	38.7	40.7	97	102	67-144	5	30		
Styrene	ug/L	<0.29	40	40	37.8	38.9	94	97	67-136	3	30		
tert-Amylmethyl ether	ug/L	<0.23	40	40	37.1	38.0	93	95	60-134	2	30		
tert-Butyl Alcohol	ug/L	<4.4	400	400	421	398	105	100	56-146	6	30		
tert-Butylbenzene	ug/L	<0.29	40	40	38.7	41.1	97	103	68-135	6	30		
Tetrachloroethene	ug/L	<0.32	40	40	39.4	39.5	98	99	67-148	0	30		
Tetrahydrofuran	ug/L	<8.6	400	400	608	644	152	161	51-141	6	30	M1	
Toluene	ug/L	<0.34	40	40	39.4	40.0	98	100	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.42	40	40	38.7	39.5	97	99	62-138	2	30		
trans-1,3-Dichloropropene	ug/L	<0.27	40	40	36.2	38.4	91	96	67-134	6	30		
trans-1,4-Dichloro-2-butene	ug/L	<5.7	100	100	76.9	82.2	77	82	30-150	7	30		
Trichloroethene	ug/L	<0.36	40	40	40.6	41.6	101	104	64-149	2	30		
Trichlorofluoromethane	ug/L	<0.26	40	40	45.7	45.4	114	113	75-150	1	30		
Vinyl acetate	ug/L	<3.0	40	40	33.8	34.9	84	87	49-143	3	30		
Vinyl chloride	ug/L	<0.19	40	40	38.3	38.0	96	95	75-133	1	30		
Xylene (Total)	ug/L	<0.49	120	120	119	124	99	104	63-142	5	30		
1,2-Dichloroethane-d4 (S)	%						98	95	75-137				
4-Bromofluorobenzene (S)	%						95	95	75-125				
Toluene-d8 (S)	%						97	96	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

QC Batch: 513906 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10414217002, 10414217003, 10414217004, 10414217005, 10414217006

METHOD BLANK: 2794628 Matrix: Water  
Associated Lab Samples: 10414217002, 10414217003, 10414217004, 10414217005, 10414217006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/16/17 01:31	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/16/17 01:31	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/16/17 01:31	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/16/17 01:31	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/16/17 01:31	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/16/17 01:31	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/16/17 01:31	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/16/17 01:31	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/16/17 01:31	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/16/17 01:31	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/16/17 01:31	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/16/17 01:31	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/16/17 01:31	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/16/17 01:31	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/16/17 01:31	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/16/17 01:31	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/16/17 01:31	
Acetone	ug/L	<8.8	20.0	8.8	12/16/17 01:31	
Acrolein	ug/L	<4.8	10.0	4.8	12/16/17 01:31	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/16/17 01:31	
Benzene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/16/17 01:31	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
Bromoform	ug/L	<1.0	4.0	1.0	12/16/17 01:31	
Bromomethane	ug/L	<1.5	4.0	1.5	12/16/17 01:31	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/16/17 01:31	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/16/17 01:31	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

METHOD BLANK: 2794628

Matrix: Water

Associated Lab Samples: 10414217002, 10414217003, 10414217004, 10414217005, 10414217006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Chloroethane	ug/L	<0.44	1.0	0.44	12/16/17 01:31	
Chloroform	ug/L	<0.46	1.0	0.46	12/16/17 01:31	
Chloromethane	ug/L	<1.1	4.0	1.1	12/16/17 01:31	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/16/17 01:31	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/16/17 01:31	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/16/17 01:31	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/16/17 01:31	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/16/17 01:31	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/16/17 01:31	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/16/17 01:31	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Naphthalene	ug/L	<0.42	1.0	0.42	12/16/17 01:31	
o-Xylene	ug/L	<0.11	0.50	0.11	12/16/17 01:31	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Styrene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/16/17 01:31	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/16/17 01:31	
Toluene	ug/L	<0.17	0.50	0.17	12/16/17 01:31	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/16/17 01:31	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/16/17 01:31	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/16/17 01:31	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/16/17 01:31	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/16/17 01:31	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/16/17 01:31	
1,2-Dichloroethane-d4 (S)	%	96	75-137		12/16/17 01:31	
4-Bromofluorobenzene (S)	%	94	75-125		12/16/17 01:31	
Toluene-d8 (S)	%	99	75-125		12/16/17 01:31	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

LABORATORY CONTROL SAMPLE: 2794629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.5	107	75-136	
1,1,1-Trichloroethane	ug/L	20	18.1	90	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	17.3	87	71-138	
1,1,2-Trichloroethane	ug/L	20	18.9	95	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.9	89	69-126	
1,1-Dichloroethane	ug/L	20	19.1	95	75-125	
1,1-Dichloroethene	ug/L	20	17.9	90	75-125	
1,1-Dichloropropene	ug/L	20	15.7	79	75-125	
1,2,3-Trichlorobenzene	ug/L	20	18.0	90	75-125	
1,2,3-Trichloropropane	ug/L	20	20.4	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	17.6	88	75-125	
1,2,4-Trimethylbenzene	ug/L	20	18.4	92	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	46.9	94	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	19.1	96	75-125	
1,2-Dichlorobenzene	ug/L	20	18.8	94	75-125	
1,2-Dichloroethane	ug/L	20	19.5	98	70-125	
1,2-Dichloroethene (Total)	ug/L	40	36.8	92	75-125	
1,2-Dichloropropane	ug/L	20	17.8	89	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.1	90	75-125	
1,3-Dichlorobenzene	ug/L	20	19.7	99	75-125	
1,3-Dichloropropane	ug/L	20	19.6	98	75-125	
1,4-Dichlorobenzene	ug/L	20	19.5	97	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	391	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	14.1	70	68-125	
2,2-Dichloropropane	ug/L	20	16.5	83	70-131	
2-Butanone (MEK)	ug/L	100	73.0	73	69-125	
2-Chlorotoluene	ug/L	20	18.8	94	75-125	
2-Hexanone	ug/L	100	94.1	94	73-129	
4-Chlorotoluene	ug/L	20	17.4	87	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.2	99	73-125	
Acetone	ug/L	100	119	119	66-126	
Acrolein	ug/L	200	185	93	56-150	
Acrylonitrile	ug/L	200	184	92	68-129	
Benzene	ug/L	20	18.7	94	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	17.1	86	75-126	
Bromodichloromethane	ug/L	20	18.7	94	75-133	
Bromoform	ug/L	20	19.9	99	62-142	
Bromomethane	ug/L	20	15.5	77	34-143	
Carbon disulfide	ug/L	20	15.9	79	71-125	
Carbon tetrachloride	ug/L	20	19.1	96	71-145	
Chlorobenzene	ug/L	20	20.1	100	75-125	
Chloroethane	ug/L	20	19.1	95	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	16.1	80	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.1	91	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.4	92	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

LABORATORY CONTROL SAMPLE: 2794629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.1	105	74-141	
Dibromomethane	ug/L	20	20.7	104	75-125	
Dichlorodifluoromethane	ug/L	20	19.4	97	59-130	
Dichlorofluoromethane	ug/L	20	18.9	95	75-125	
Diisopropyl ether	ug/L	20	18.3	92	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.3	91	73-125	
Ethylbenzene	ug/L	20	19.8	99	75-125	
Hexachloro-1,3-butadiene	ug/L	20	18.5	93	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.1	95	75-125	
m&p-Xylene	ug/L	40	41.5	104	75-125	
Methyl-tert-butyl ether	ug/L	20	19.2	96	75-125	
Methylene Chloride	ug/L	20	16.5	82	73-125	
n-Butylbenzene	ug/L	20	17.4	87	75-125	
n-Propylbenzene	ug/L	20	17.3	86	75-125	
Naphthalene	ug/L	20	16.2	81	74-125	
o-Xylene	ug/L	20	19.3	96	75-125	
p-Isopropyltoluene	ug/L	20	18.5	93	75-125	
sec-Butylbenzene	ug/L	20	18.0	90	75-125	
Styrene	ug/L	20	19.7	99	75-125	
tert-Amylmethyl ether	ug/L	20	19.2	96	71-126	
tert-Butyl Alcohol	ug/L	200	244	122	69-131	
tert-Butylbenzene	ug/L	20	18.5	92	75-125	
Tetrachloroethene	ug/L	20	19.3	96	75-125	
Tetrahydrofuran	ug/L	200	187	94	65-127	
Toluene	ug/L	20	19.3	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.2	96	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	39.0	78	30-150	
Trichloroethene	ug/L	20	20.0	100	75-125	
Trichlorofluoromethane	ug/L	20	20.7	103	71-140	
Vinyl acetate	ug/L	20	17.2	86	68-137	
Vinyl chloride	ug/L	20	17.2	86	70-125	
Xylene (Total)	ug/L	60	60.7	101	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			93	75-125	
Toluene-d8 (S)	%			96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630 2794631

Parameter	Units	10414412001		MSD		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	20.7	19.9	104	100	75-137	4	30				
1,1,1-Trichloroethane	ug/L	<0.15	20	20	20.3	18.1	101	91	75-139	11	30				
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	16.8	17.6	84	88	60-142	5	30				
1,1,2-Trichloroethane	ug/L	<0.22	20	20	18.3	17.7	91	88	75-128	3	30				

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Parameter	Units	10414412001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630 2794631																
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	20.1	19.4	100	97	62-150	3	30					
1,1-Dichloroethane	ug/L	<0.14	20	20	18.8	19.4	94	97	70-129	3	30					
1,1-Dichloroethene	ug/L	<0.18	20	20	18.5	18.3	92	92	67-141	1	30					
1,1-Dichloropropene	ug/L	<0.18	20	20	17.5	15.7	87	78	64-144	11	30					
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	20.9	20.1	105	100	66-139	4	30					
1,2,3-Trichloropropane	ug/L	<0.66	20	20	20.2	20.5	101	103	69-134	2	30					
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	18.8	18.8	94	94	65-138	0	30					
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	18.5	18.3	92	92	65-143	1	30					
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	47.2	48.0	94	96	61-134	2	30					
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	17.7	17.3	88	87	74-129	2	30					
1,2-Dichlorobenzene	ug/L	<0.21	20	20	19.8	19.7	99	99	68-135	1	30					
1,2-Dichloroethane	ug/L	<0.15	20	20	18.9	18.3	94	92	73-125	3	30					
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	35.5	38.0	89	95	69-134	7	30					
1,2-Dichloropropane	ug/L	<0.62	20	20	16.4	17.2	82	86	64-130	5	30					
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	18.7	18.6	94	93	64-146	1	30					
1,3-Dichlorobenzene	ug/L	<0.16	20	20	20.1	20.0	100	100	69-135	0	30					
1,3-Dichloropropane	ug/L	<0.13	20	20	18.7	18.0	93	90	67-128	4	30					
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	19.6	98	98	66-134	0	30					
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	362	346	90	86	58-140	4	30					
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.8	16.3	84	81	48-150	3	30					
2,2-Dichloropropane	ug/L	<0.40	20	20	17.6	17.4	88	87	50-150	1	30					
2-Butanone (MEK)	ug/L	<2.4	100	100	80.6	65.4	81	65	58-125	21	30					
2-Chlorotoluene	ug/L	<0.20	20	20	19.0	18.8	95	94	65-138	1	30					
2-Hexanone	ug/L	<2.5	100	100	90.9	89.1	91	89	61-134	2	30					
4-Chlorotoluene	ug/L	<0.13	20	20	17.7	17.8	88	89	68-135	1	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	94.3	91.6	94	92	61-130	3	30					
Acetone	ug/L	<8.8	100	100	143	155	143	155	51-140	8	30	M1				
Acrolein	ug/L	<4.8	200	200	187	191	94	96	48-150	2	30					
Acrylonitrile	ug/L	<4.9	200	200	168	179	84	89	55-134	6	30					
Benzene	ug/L	<0.13	20	20	17.6	17.6	88	88	63-132	0	30					
Bromobenzene	ug/L	<0.16	20	20	20.3	20.4	102	102	67-138	0	30					
Bromochloromethane	ug/L	<0.38	20	20	18.3	16.8	91	84	66-138	8	30					
Bromodichloromethane	ug/L	<0.20	20	20	16.8	18.2	84	91	75-137	8	30					
Bromoform	ug/L	<1.0	20	20	18.2	19.2	91	96	65-129	5	30					
Bromomethane	ug/L	<1.5	20	20	17.7	18.3	88	91	41-150	3	30					
Carbon disulfide	ug/L	0.66J	20	20	17.1	17.1	82	82	72-132	0	30					
Carbon tetrachloride	ug/L	134	20	20	148	137	74	15	75-150	8	30	M1				
Chlorobenzene	ug/L	<0.14	20	20	19.6	18.8	98	94	73-127	4	30					
Chloroethane	ug/L	<0.44	20	20	19.9	20.6	99	103	74-138	3	30					
Chloroform	ug/L	9.4	20	20	25.6	23.8	81	72	74-125	7	30	M1				
Chloromethane	ug/L	<1.1	20	20	16.8	16.4	84	82	58-129	2	30					
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	16.3	18.5	81	93	63-135	13	30					
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	15.5	17.6	77	88	66-129	13	30					
Dibromochloromethane	ug/L	<0.13	20	20	20.5	20.0	102	100	75-133	2	30					

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Parameter	Units	2794630		2794631		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10414412001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<0.50	20	20	18.1	20.0	90	100	68-134	10	30		
Dichlorodifluoromethane	ug/L	<0.31	20	20	22.4	21.9	112	110	72-150	2	30		
Dichlorofluoromethane	ug/L	<0.38	20	20	19.6	20.1	98	101	75-129	2	30		
Diisopropyl ether	ug/L	<0.12	20	20	17.9	18.1	90	91	62-128	1	30		
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	16.7	17.9	83	90	63-132	7	30		
Ethylbenzene	ug/L	<0.14	20	20	19.6	19.1	98	96	72-130	2	30		
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	21.2	20.0	106	100	71-150	6	30		
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	19.0	18.2	95	91	70-136	4	30		
m&p-Xylene	ug/L	<0.24	40	40	41.8	39.7	104	99	64-142	5	30		
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.5	18.6	92	93	72-125	1	30		
Methylene Chloride	ug/L	<1.2	20	20	16.2	16.9	81	85	60-132	4	30		
n-Butylbenzene	ug/L	<0.13	20	20	18.3	17.6	92	88	60-150	4	30		
n-Propylbenzene	ug/L	<0.12	20	20	18.2	17.7	91	89	63-142	3	30		
Naphthalene	ug/L	<0.42	20	20	18.8	18.7	94	93	67-125	1	30		
o-Xylene	ug/L	<0.11	20	20	18.8	18.3	94	92	60-143	3	30		
p-Isopropyltoluene	ug/L	<0.14	20	20	18.8	18.5	94	92	64-146	2	30		
sec-Butylbenzene	ug/L	<0.12	20	20	19.0	18.4	95	92	67-144	3	30		
Styrene	ug/L	<0.14	20	20	18.0	17.4	90	87	67-136	3	30		
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.6	17.9	93	89	60-134	4	30		
tert-Butyl Alcohol	ug/L	<2.2	200	200	222	206	111	103	56-146	7	30		
tert-Butylbenzene	ug/L	<0.15	20	20	19.0	18.2	95	91	68-135	4	30		
Tetrachloroethene	ug/L	<0.16	20	20	19.2	18.5	96	92	67-148	4	30		
Tetrahydrofuran	ug/L	<4.3	200	200	270	233	135	116	51-141	15	30		
Toluene	ug/L	<0.17	20	20	18.9	18.3	94	92	61-140	3	30		
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.3	19.5	96	97	62-138	1	30		
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	18.4	17.7	92	88	67-134	4	30		
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	37.0	38.0	74	76	30-150	3	30		
Trichloroethene	ug/L	<0.18	20	20	19.9	20.6	100	103	64-149	3	30		
Trichlorofluoromethane	ug/L	<0.13	20	20	22.7	22.9	114	114	75-150	1	30		
Vinyl acetate	ug/L	<1.5	20	20	14.5	15.7	73	79	49-143	8	30		
Vinyl chloride	ug/L	<0.096	20	20	18.9	19.2	95	96	75-133	1	30		
Xylene (Total)	ug/L	<0.24	60	60	60.5	58.0	101	97	63-142	4	30		
1,2-Dichloroethane-d4 (S)	%						96	97	75-137				
4-Bromofluorobenzene (S)	%						94	94	75-125				
Toluene-d8 (S)	%						96	95	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414217

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414217001	MW13S-GW-121117	EPA 8260B	513905		
10414217002	MARLOWW20-GW-121117	EPA 8260B	513906		
10414217003	MW22S-GW-121217	EPA 8260B	513906		
10414217004	SG01-121217	EPA 8260B	513906		
10414217005	SG02-121217	EPA 8260B	513906		
10414217006	TRIP BLANK	EPA 8260B	513906		

### REPORT OF LABORATORY ANALYSIS

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<b>Section A</b>		<b>Section B</b>		<b>Section C</b>		<b>Page :</b> <u>1</u> <b>Of</b> <u>1</u>
<b>Required Client Information:</b>		<b>Required Project Information:</b>		<b>Invoice Information:</b>		
<b>Company:</b> CH2M Hill		<b>Report To:</b> Mark Ochsner, Brad Ostapkowicz		<b>Attention:</b> Anne Walsh		
<b>Address:</b> 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		<b>Copy To:</b> Steve Demus, Lindsey Baumann		<b>Company:</b> UPRR		
<b>Email:</b>		<b>Copy To:</b> David Hodson, UPRR-Sysdat@ghd.com		<b>Address:</b> 1400 W. 52nd Ave, Denver, CO 80221		<b>Regulatory Agency</b>
<b>Phone:</b>		<b>Purchase Order #:</b> PEDD# 1497-39-Rev1		<b>Pace Quote:</b> Contract# 758938		
<b>Requested Due Date:</b> 10 Day Standard		<b>Project Name:</b> Freeman WA-Grain Handling Facility		<b>Pace Project Manager:</b> Jennifer Gross		<b>State / Location</b>
	<b>Fax:</b>	<b>Project #:</b> 1497		<b>Pace Profile #:</b> 36447		<b>WA / Freeman</b>

ITEM #	SAMPLE ID <small>One Character per box. (A-Z, 0-9, -)</small> Sample IDs must be unique	MATRIX CODE (see valid codes to left)	CODE	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyzes Test Y/N	Requested Analysis Filtered (Y/N)																			
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Y		Low Level VOCs by B260	60107470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4600	Methane, Ethane, Ethene RSR175	COD 410.4	Nitrate+Nitrite 353.2										
				DATE	TIME	DATE	TIME																														
1	MW135-GW-12117	WTG	G	12/11/17	11:25			3				X																									001
2	MARLOWW20-GW-12117	WTG	G	12/11/17	12:45			3				X																								002	
3	MW225-GW-121217	WTG	G	12/12/17	9:50			3				X																							003		
4	SG01-121217	WTG	G	12/12/17	13:50			3				X																							004		
5	SG02-121217	WTG	G	12/12/17	14:00			3				X																							005		
6	Trip Blank	WTG	G	12/12/17				2				X																							006		
7																																			<del>00</del>		
8																																		EA 12-15-17			
9																																					
10																																					
11																																					
12																																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	Jamie Brown / CH2M	12/12/17	17:00	<i>[Signature]</i>	Pace	12/13/17	950 0.8 Y Y Y
*Field filtered by client							

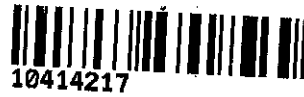
SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<b>JAMIE BROWN</b>					
SIGNATURE of SAMPLER:	<i>[Signature]</i>	DATE Signed:	12/12/17			

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: **CH2M**

Project #:

**WO#: 10414217**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: **7448 1032 9720**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer Used:  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None Samples on ice, cooling process has begun

Cooler Temp Read (°C): **0.7** Cooler Temp Corrected (°C): **0.8** Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: **+0.1** Date and initials of Person Examining Contents: **12/13/17 mD**

**USDA Regulated Soil** ( N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

			COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.	
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.	
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.	
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.	
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.	
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.	
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8.	<b>NO MS/MSD</b>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.	
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.	Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12.	<b>times on sample 2 says 1440 times on sample 3 says 1100</b>
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.	<input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #	
Exceptions: <input checked="" type="checkbox"/> VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed:	Lot # of added preservative:
Per method, VOA pH is checked after analysis			
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.	
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.	<b>2 trip blanks present</b>
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased): <b>141537</b>			

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: **Lindsey Baumann**

Field Data Required?  Yes  No

Date/Time: **12/14/17**

Comments/Resolution: **Times are correct on the containers not on the coc.**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1130</b>	Temp: <b>0.7</b>	Corrected Temp: <b>0.8</b>
Time: <b>1150</b>	put in cooler	
Time:	Temp:	Corrected Temp:

**Project Manager Review:**

**JENNI GROSS**

Date: **12/13/17**

Note: Whenever there is a discrepancy affecting North Carolina comp hold, incorrect preservative, out of temp, incorrect containers)

form will be sent to the North Carolina DEHNR Certification Office (i.e out of

December 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

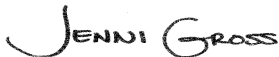
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 13, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414223001	MW13S-GW-121117	Water	12/11/17 11:25	12/13/17 09:50
10414223002	MARLOWW20-GW-121117	Water	12/11/17 14:40	12/13/17 09:50
10414223003	MW22S-GW-121217	Water	12/12/17 11:00	12/13/17 09:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414223001	MW13S-GW-121117	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414223002	MARLOWW20-GW-121117	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414223003	MW22S-GW-121217	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10414223001</b>	<b>MW13S-GW-121117</b>					
RSK 175	Methane	7.5J	ug/L	10.0	12/14/17 15:01	
6010C Met	Aluminum, Dissolved	27.8J	ug/L	200	12/27/17 16:15	
6010C Met	Barium, Dissolved	61.6	ug/L	10.0	12/27/17 16:15	
6010C Met	Calcium, Dissolved	35100	ug/L	500	12/27/17 16:15	
6010C Met	Chromium, Dissolved	0.63J	ug/L	10.0	12/27/17 16:15	
6010C Met	Copper, Dissolved	0.85J	ug/L	10.0	12/27/17 16:15	
6010C Met	Iron, Dissolved	34.7J	ug/L	50.0	12/27/17 16:15	
6010C Met	Magnesium, Dissolved	10200	ug/L	500	12/27/17 16:15	
6010C Met	Manganese, Dissolved	0.63J	ug/L	5.0	12/27/17 16:15	
6010C Met	Potassium, Dissolved	1230J	ug/L	2500	12/27/17 16:15	
6010C Met	Sodium, Dissolved	13400	ug/L	1000	12/27/17 16:15	
6010C Met	Thallium, Dissolved	9.8J	ug/L	20.0	12/27/17 16:15	
6010C Met	Vanadium, Dissolved	8.8J	ug/L	15.0	12/27/17 16:15	
6010C Met	Zinc, Dissolved	2.5J	ug/L	20.0	12/27/17 16:15	
SM 2320B	Alkalinity, Total as CaCO3	161	mg/L	5.0	12/16/17 15:08	
SM 2540C	Total Dissolved Solids	214	mg/L	10.0	12/18/17 16:02	
EPA 300.0	Chloride	1.2J	mg/L	1.2	12/13/17 11:54	
EPA 300.0	Nitrate as N	0.19	mg/L	0.10	12/13/17 11:54	H1
EPA 300.0	Sulfate	4.2	mg/L	1.2	12/13/17 11:54	
EPA 353.2	Nitrogen, NO2 plus NO3	0.21	mg/L	0.020	12/15/17 12:20	
SM 5310C	Total Organic Carbon	2.4	mg/L	1.0	12/20/17 20:07	
<b>10414223002</b>	<b>MARLOWW20-GW-121117</b>					
RSK 175	Methane	120	ug/L	10.0	12/14/17 15:16	
6010C Met	Barium, Dissolved	3.6J	ug/L	10.0	12/27/17 16:34	
6010C Met	Calcium, Dissolved	15100	ug/L	500	12/27/17 16:34	
6010C Met	Iron, Dissolved	151	ug/L	50.0	12/27/17 16:34	
6010C Met	Magnesium, Dissolved	6040	ug/L	500	12/27/17 16:34	
6010C Met	Manganese, Dissolved	69.8	ug/L	5.0	12/27/17 16:34	
6010C Met	Potassium, Dissolved	1800J	ug/L	2500	12/27/17 16:34	
6010C Met	Sodium, Dissolved	8360	ug/L	1000	12/27/17 16:34	
6010C Met	Thallium, Dissolved	8.8J	ug/L	20.0	12/27/17 16:34	
6010C Met	Zinc, Dissolved	7.1J	ug/L	20.0	12/27/17 16:34	
SM 2320B	Alkalinity, Total as CaCO3	85.5	mg/L	5.0	12/16/17 15:12	
SM 2540C	Total Dissolved Solids	89.0	mg/L	10.0	12/18/17 16:02	
EPA 300.0	Chloride	2.3	mg/L	1.2	12/13/17 12:09	
EPA 300.0	Sulfate	0.67J	mg/L	1.2	12/13/17 12:09	B
SM 5310C	Total Organic Carbon	1.7	mg/L	1.0	12/20/17 20:49	
<b>10414223003</b>	<b>MW22S-GW-121217</b>					
RSK 175	Methane	4.7J	ug/L	10.0	12/14/17 15:59	
6010C Met	Barium, Dissolved	65.6	ug/L	10.0	12/27/17 16:38	
6010C Met	Cadmium, Dissolved	1.3J	ug/L	3.0	12/27/17 16:38	
6010C Met	Calcium, Dissolved	46700	ug/L	500	12/27/17 16:38	
6010C Met	Cobalt, Dissolved	2.9J	ug/L	10.0	12/27/17 16:38	
6010C Met	Copper, Dissolved	0.89J	ug/L	10.0	12/27/17 16:38	
6010C Met	Magnesium, Dissolved	17500	ug/L	500	12/27/17 16:38	
6010C Met	Manganese, Dissolved	461	ug/L	5.0	12/27/17 16:38	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414223003</b>	<b>MW22S-GW-121217</b>					
6010C Met	Nickel, Dissolved	2.8J	ug/L	20.0	12/27/17 16:38	
6010C Met	Potassium, Dissolved	3240	ug/L	2500	12/27/17 16:38	
6010C Met	Sodium, Dissolved	20400	ug/L	1000	12/27/17 16:38	
6010C Met	Thallium, Dissolved	6.0J	ug/L	20.0	12/27/17 16:38	
6010C Met	Vanadium, Dissolved	4.0J	ug/L	15.0	12/27/17 16:38	
6010C Met	Zinc, Dissolved	5.8J	ug/L	20.0	12/27/17 16:38	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	214	mg/L	5.0	12/16/17 15:29	
SM 2540C	Total Dissolved Solids	294	mg/L	10.0	12/18/17 16:02	
EPA 300.0	Chloride	4.3	mg/L	1.2	12/13/17 12:24	
EPA 300.0	Nitrate as N	2.0	mg/L	0.10	12/13/17 12:24	
EPA 300.0	Sulfate	14.9	mg/L	1.2	12/13/17 12:24	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	2.2	mg/L	0.040	12/15/17 12:43	
SM 5310C	Total Organic Carbon	1.3J	mg/L	2.0	12/27/17 17:03	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

### General Information:

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 96900

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2066972001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 417081)
- Sulfide, Total

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

### General Information:

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW13S-GW-121117 (Lab ID: 10414223001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 513428

B: Analyte was detected in the associated method blank.

- BLANK for HBN 513428 [WETA/337 (Lab ID: 2791724)
- Sulfate

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 513873

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2794481)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2794482)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

**Sample:** MW13S-GW-121117      **Lab ID:** 10414223001      Collected: 12/11/17 11:25      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/14/17 15:01	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/14/17 15:01	74-85-1	
Methane	7.5J	ug/L	10.0	1.1	1		12/14/17 15:01	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	27.8J	ug/L	200	8.6	1	12/14/17 09:25	12/27/17 16:15	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/14/17 09:25	12/27/17 16:15	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/14/17 09:25	12/27/17 16:15	7440-38-2	
Barium, Dissolved	61.6	ug/L	10.0	0.22	1	12/14/17 09:25	12/27/17 16:15	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/14/17 09:25	12/27/17 16:15	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/14/17 09:25	12/27/17 16:15	7440-43-9	
Calcium, Dissolved	35100	ug/L	500	24.7	1	12/14/17 09:25	12/27/17 16:15	7440-70-2	
Chromium, Dissolved	0.63J	ug/L	10.0	0.50	1	12/14/17 09:25	12/27/17 16:15	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/14/17 09:25	12/27/17 16:15	7440-48-4	
Copper, Dissolved	0.85J	ug/L	10.0	0.83	1	12/14/17 09:25	12/27/17 16:15	7440-50-8	
Iron, Dissolved	34.7J	ug/L	50.0	16.7	1	12/14/17 09:25	12/27/17 16:15	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/14/17 09:25	12/27/17 16:15	7439-92-1	
Magnesium, Dissolved	10200	ug/L	500	2.6	1	12/14/17 09:25	12/27/17 16:15	7439-95-4	
Manganese, Dissolved	0.63J	ug/L	5.0	0.38	1	12/14/17 09:25	12/27/17 16:15	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/14/17 09:25	12/27/17 16:15	7440-02-0	
Potassium, Dissolved	1230J	ug/L	2500	126	1	12/14/17 09:25	12/27/17 16:15	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/14/17 09:25	12/27/17 16:15	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/14/17 09:25	12/27/17 16:15	7440-22-4	
Sodium, Dissolved	13400	ug/L	1000	44.6	1	12/14/17 09:25	12/27/17 16:15	7440-23-5	
Thallium, Dissolved	9.8J	ug/L	20.0	4.8	1	12/14/17 09:25	12/27/17 16:15	7440-28-0	
Vanadium, Dissolved	8.8J	ug/L	15.0	0.42	1	12/14/17 09:25	12/27/17 16:15	7440-62-2	
Zinc, Dissolved	2.5J	ug/L	20.0	1.8	1	12/14/17 09:25	12/27/17 16:15	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/14/17 11:51	12/17/17 17:10	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	161	mg/L	5.0	1.4	1		12/16/17 15:08		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	214	mg/L	10.0	5.0	1		12/18/17 16:02		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/15/17 11:25	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.2J	mg/L	1.2	0.14	1		12/13/17 11:54	16887-00-6	
Nitrate as N	0.19	mg/L	0.10	0.0079	1		12/13/17 11:54	14797-55-8	H1
Sulfate	4.2	mg/L	1.2	0.27	1		12/13/17 11:54	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Sample: MW13S-GW-121117**      **Lab ID: 10414223001**      Collected: 12/11/17 11:25      Received: 12/13/17 09:50      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.21</b>	mg/L	0.020	0.0075	1		12/15/17 12:20		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:14		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>2.4</b>	mg/L	1.0	0.20	1		12/20/17 20:07	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

Sample: **MARLOWW20-GW-121117** Lab ID: **10414223002** Collected: 12/11/17 14:40 Received: 12/13/17 09:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/14/17 15:16	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/14/17 15:16	74-85-1	
Methane	120	ug/L	10.0	1.1	1		12/14/17 15:16	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/14/17 09:25	12/27/17 16:34	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/14/17 09:25	12/27/17 16:34	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/14/17 09:25	12/27/17 16:34	7440-38-2	
Barium, Dissolved	3.6J	ug/L	10.0	0.22	1	12/14/17 09:25	12/27/17 16:34	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/14/17 09:25	12/27/17 16:34	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/14/17 09:25	12/27/17 16:34	7440-43-9	
Calcium, Dissolved	15100	ug/L	500	24.7	1	12/14/17 09:25	12/27/17 16:34	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/14/17 09:25	12/27/17 16:34	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/14/17 09:25	12/27/17 16:34	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	12/14/17 09:25	12/27/17 16:34	7440-50-8	
Iron, Dissolved	151	ug/L	50.0	16.7	1	12/14/17 09:25	12/27/17 16:34	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/14/17 09:25	12/27/17 16:34	7439-92-1	
Magnesium, Dissolved	6040	ug/L	500	2.6	1	12/14/17 09:25	12/27/17 16:34	7439-95-4	
Manganese, Dissolved	69.8	ug/L	5.0	0.38	1	12/14/17 09:25	12/27/17 16:34	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/14/17 09:25	12/27/17 16:34	7440-02-0	
Potassium, Dissolved	1800J	ug/L	2500	126	1	12/14/17 09:25	12/27/17 16:34	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/14/17 09:25	12/27/17 16:34	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/14/17 09:25	12/27/17 16:34	7440-22-4	
Sodium, Dissolved	8360	ug/L	1000	44.6	1	12/14/17 09:25	12/27/17 16:34	7440-23-5	
Thallium, Dissolved	8.8J	ug/L	20.0	4.8	1	12/14/17 09:25	12/27/17 16:34	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	12/14/17 09:25	12/27/17 16:34	7440-62-2	
Zinc, Dissolved	7.1J	ug/L	20.0	1.8	1	12/14/17 09:25	12/27/17 16:34	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/14/17 11:51	12/17/17 17:12	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	85.5	mg/L	5.0	1.4	1		12/16/17 15:12		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	89.0	mg/L	10.0	5.0	1		12/18/17 16:02		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/15/17 11:27	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.3	mg/L	1.2	0.14	1		12/13/17 12:09	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		12/13/17 12:09	14797-55-8	
Sulfate	0.67J	mg/L	1.2	0.27	1		12/13/17 12:09	14808-79-8	B

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Sample: MARLOWW20-GW-121117**    **Lab ID: 10414223002**    Collected: 12/11/17 14:40    Received: 12/13/17 09:50    Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		12/15/17 12:22		
<b>410.4 COD</b>	Analytical Method: EPA 410.4    Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:15		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.7</b>	mg/L	1.0	0.20	1		12/20/17 20:49	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

**Sample:** MW22S-GW-121217      **Lab ID:** 10414223003      Collected: 12/12/17 11:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/14/17 15:59	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/14/17 15:59	74-85-1	
Methane	4.7J	ug/L	10.0	1.1	1		12/14/17 15:59	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/14/17 09:25	12/27/17 16:38	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/14/17 09:25	12/27/17 16:38	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/14/17 09:25	12/27/17 16:38	7440-38-2	
Barium, Dissolved	65.6	ug/L	10.0	0.22	1	12/14/17 09:25	12/27/17 16:38	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/14/17 09:25	12/27/17 16:38	7440-41-7	
Cadmium, Dissolved	1.3J	ug/L	3.0	0.46	1	12/14/17 09:25	12/27/17 16:38	7440-43-9	
Calcium, Dissolved	46700	ug/L	500	24.7	1	12/14/17 09:25	12/27/17 16:38	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/14/17 09:25	12/27/17 16:38	7440-47-3	
Cobalt, Dissolved	2.9J	ug/L	10.0	1.1	1	12/14/17 09:25	12/27/17 16:38	7440-48-4	
Copper, Dissolved	0.89J	ug/L	10.0	0.83	1	12/14/17 09:25	12/27/17 16:38	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/14/17 09:25	12/27/17 16:38	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/14/17 09:25	12/27/17 16:38	7439-92-1	
Magnesium, Dissolved	17500	ug/L	500	2.6	1	12/14/17 09:25	12/27/17 16:38	7439-95-4	
Manganese, Dissolved	461	ug/L	5.0	0.38	1	12/14/17 09:25	12/27/17 16:38	7439-96-5	
Nickel, Dissolved	2.8J	ug/L	20.0	1.1	1	12/14/17 09:25	12/27/17 16:38	7440-02-0	
Potassium, Dissolved	3240	ug/L	2500	126	1	12/14/17 09:25	12/27/17 16:38	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/14/17 09:25	12/27/17 16:38	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/14/17 09:25	12/27/17 16:38	7440-22-4	
Sodium, Dissolved	20400	ug/L	1000	44.6	1	12/14/17 09:25	12/27/17 16:38	7440-23-5	
Thallium, Dissolved	6.0J	ug/L	20.0	4.8	1	12/14/17 09:25	12/27/17 16:38	7440-28-0	
Vanadium, Dissolved	4.0J	ug/L	15.0	0.42	1	12/14/17 09:25	12/27/17 16:38	7440-62-2	
Zinc, Dissolved	5.8J	ug/L	20.0	1.8	1	12/14/17 09:25	12/27/17 16:38	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/14/17 11:51	12/17/17 17:14	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	214	mg/L	5.0	1.4	1		12/16/17 15:29		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	294	mg/L	10.0	5.0	1		12/18/17 16:02		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/15/17 11:28	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	4.3	mg/L	1.2	0.14	1		12/13/17 12:24	16887-00-6	
Nitrate as N	2.0	mg/L	0.10	0.0079	1		12/13/17 12:24	14797-55-8	
Sulfate	14.9	mg/L	1.2	0.27	1		12/13/17 12:24	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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**Sample: MW22S-GW-121217**      **Lab ID: 10414223003**      Collected: 12/12/17 11:00      Received: 12/13/17 09:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>2.2</b>	mg/L	0.040	0.015	2		12/15/17 12:43		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:15		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.3J</b>	mg/L	2.0	0.40	2		12/27/17 17:03	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

QC Batch: 513613 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2792880 Matrix: Water  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/14/17 14:47	
Ethene	ug/L	<0.68	10.0	0.68	12/14/17 14:47	
Methane	ug/L	5.7J	10.0	1.1	12/14/17 14:47	

LABORATORY CONTROL SAMPLE & LCSD: 2792881

Parameter	Units	2792882								Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	114	108	104	95	91	85-115	5	20	
Ethene	ug/L	106	102	96.4	96	91	85-115	5	20	
Methane	ug/L	60.7	57.7	54.4	95	90	85-115	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2792884

Parameter	Units	2792885										Qual
		10414343003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	
Ethane	ug/L	ND	114	114	81.7	71.1	71	62	30-150	14	20	
Ethene	ug/L	ND	106	106	77.3	67.6	71	62	30-150	13	20	
Methane	ug/L	ND	60.7	60.7	44.9	39.0	68	58	30-150	14	20	

SAMPLE DUPLICATE: 2792883

Parameter	Units	10414223001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	7.5J	5.8J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

QC Batch: 513554

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2792736

Matrix: Water

Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	12/17/17 16:45	

LABORATORY CONTROL SAMPLE: 2792737

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.8	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2792738 2792739

Parameter	Units	10413788002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury, Dissolved	ug/L	ND	5	5	5	4.9	4.9	99	98	80-120	1	20			

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

QC Batch: 513555 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2792740 Matrix: Water  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	12/27/17 16:07	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	12/27/17 16:07	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	12/27/17 16:07	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	12/27/17 16:07	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	12/27/17 16:07	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	12/27/17 16:07	
Calcium, Dissolved	ug/L	<24.7	500	24.7	12/27/17 16:07	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	12/27/17 16:07	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	12/27/17 16:07	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	12/27/17 16:07	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	12/27/17 16:07	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	12/27/17 16:07	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	12/27/17 16:07	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	12/27/17 16:07	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	12/27/17 16:07	
Potassium, Dissolved	ug/L	<126	2500	126	12/27/17 16:07	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	12/27/17 16:07	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	12/27/17 16:07	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	12/27/17 16:07	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	12/27/17 16:07	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	12/27/17 16:07	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	12/27/17 16:07	

LABORATORY CONTROL SAMPLE: 2792741

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20400	102	80-120	
Antimony, Dissolved	ug/L	1000	964	96	80-120	
Arsenic, Dissolved	ug/L	1000	959	96	80-120	
Barium, Dissolved	ug/L	1000	985	99	80-120	
Beryllium, Dissolved	ug/L	1000	990	99	80-120	
Cadmium, Dissolved	ug/L	1000	963	96	80-120	
Calcium, Dissolved	ug/L	20000	18700	93	80-120	
Chromium, Dissolved	ug/L	1000	972	97	80-120	
Cobalt, Dissolved	ug/L	1000	967	97	80-120	
Copper, Dissolved	ug/L	1000	932	93	80-120	
Iron, Dissolved	ug/L	20000	19200	96	80-120	
Lead, Dissolved	ug/L	1000	972	97	80-120	
Magnesium, Dissolved	ug/L	20000	18800	94	80-120	
Manganese, Dissolved	ug/L	1000	984	98	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

LABORATORY CONTROL SAMPLE: 2792741

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	979	98	80-120	
Potassium, Dissolved	ug/L	20000	19000	95	80-120	
Selenium, Dissolved	ug/L	1000	1020	102	80-120	
Silver, Dissolved	ug/L	500	467	93	80-120	
Sodium, Dissolved	ug/L	20000	19000	95	80-120	
Thallium, Dissolved	ug/L	1000	954	95	80-120	
Vanadium, Dissolved	ug/L	1000	925	93	80-120	
Zinc, Dissolved	ug/L	1000	982	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2792742 2792743

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10414223001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	27.8J	20000	20000	21000	21600	105	108	75-125	3	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	1010	1040	101	104	75-125	3	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	981	1010	98	101	75-125	2	20	
Barium, Dissolved	ug/L	61.6	1000	1000	1060	1090	100	103	75-125	2	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	1010	1040	101	104	75-125	3	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	976	1000	98	100	75-125	3	20	
Calcium, Dissolved	ug/L	35100	20000	20000	54700	55900	98	104	75-125	2	20	
Chromium, Dissolved	ug/L	0.63J	1000	1000	988	1010	99	101	75-125	3	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	969	998	97	100	75-125	3	20	
Copper, Dissolved	ug/L	0.85J	1000	1000	956	983	96	98	75-125	3	20	
Iron, Dissolved	ug/L	34.7J	20000	20000	19600	20200	98	101	75-125	3	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	981	1010	98	100	75-125	3	20	
Magnesium, Dissolved	ug/L	10200	20000	20000	29800	30500	98	102	75-125	2	20	
Manganese, Dissolved	ug/L	0.63J	1000	1000	996	1020	100	102	75-125	3	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	976	1000	98	100	75-125	3	20	
Potassium, Dissolved	ug/L	1230J	20000	20000	21300	21800	100	103	75-125	3	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1020	1040	102	104	75-125	2	20	
Silver, Dissolved	ug/L	<0.27	500	500	477	489	95	98	75-125	3	20	
Sodium, Dissolved	ug/L	13400	20000	20000	33100	33900	99	102	75-125	2	20	
Thallium, Dissolved	ug/L	9.8J	1000	1000	972	1010	96	100	75-125	4	20	
Vanadium, Dissolved	ug/L	8.8J	1000	1000	952	978	94	97	75-125	3	20	
Zinc, Dissolved	ug/L	2.5J	1000	1000	980	1000	98	100	75-125	2	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

QC Batch: 514065 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2795854 Matrix: Water  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	12/16/17 14:21	

LABORATORY CONTROL SAMPLE & LCSD: 2795855 2795856

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	40.9	40.8	102	102	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795857 2795858

Parameter	Units	10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	176	40	40	219	219	107	107	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795859 2795860

Parameter	Units	10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	155	40	40	197	202	104	116	80-120	2	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

QC Batch: 514330

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2796777

Matrix: Water

Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/18/17 16:02	

LABORATORY CONTROL SAMPLE: 2796778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	970	97	80-120	

SAMPLE DUPLICATE: 2796779

Parameter	Units	10414076001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1810	1770	3	10	

SAMPLE DUPLICATE: 2796780

Parameter	Units	10414407001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	257	250	3	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

QC Batch: 96900 Analysis Method: SM 4500-S-2 D  
QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 417078 Matrix: Water  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/15/17 11:17	

LABORATORY CONTROL SAMPLE: 417079

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	106	90-110	

MATRIX SPIKE SAMPLE: 417081

Parameter	Units	2066972001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.049	25	75-125	M1

SAMPLE DUPLICATE: 417080

Parameter	Units	2066972001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

QC Batch: 513428

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2791724

Matrix: Water

Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	12/13/17 16:41	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/13/17 16:41	
Sulfate	mg/L	0.40J	1.2	0.27	12/13/17 16:41	

LABORATORY CONTROL SAMPLE: 2791725

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.6	101	90-110	
Nitrate as N	mg/L	1	0.98	98	90-110	
Sulfate	mg/L	12.5	12.8	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2791726 2791727

Parameter	Units	10414024002		2791726		2791727		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	<0.14	12.5	12.5	12.5	12.3	100	99	90-110	2	20		
Nitrate as N	mg/L	<0.0079	1	1	0.98	0.96	98	96	90-110	2	20		
Sulfate	mg/L	0.42J	12.5	12.5	12.6	12.2	97	95	90-110	3	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

QC Batch: 513873

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2794479

Matrix: Water

Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/15/17 12:34	

LABORATORY CONTROL SAMPLE: 2794480

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794481 2794482

Parameter	Units	2794481		2794482		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	2.6	2	2	4.4	4.5	91	94	90-110	1	20 E

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

QC Batch: 513838 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

METHOD BLANK: 2794369 Matrix: Water  
Associated Lab Samples: 10414223001, 10414223002, 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	12/15/17 13:13	

LABORATORY CONTROL SAMPLE: 2794370

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	296	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794371 2794372

Parameter	Units	10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	278	256	105	97	90-110	8	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794373 2794374

Parameter	Units	10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	255	253	102	101	90-110	1	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

QC Batch: 133711

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10414223001, 10414223002

METHOD BLANK: 532841

Matrix: Water

Associated Lab Samples: 10414223001, 10414223002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	12/20/17 14:17	

LABORATORY CONTROL SAMPLE: 532842

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.8	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 532843 532844

Parameter	Units	10414019009 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Total Organic Carbon	mg/L	11.1	25	25	35.6	35.0	98	95	80-120	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 532845 532846

Parameter	Units	10414223001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Total Organic Carbon	mg/L	2.4	25	25	27.5	27.4	100	100	80-120	0	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

QC Batch: 133981

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10414223003

METHOD BLANK: 534026

Matrix: Water

Associated Lab Samples: 10414223003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	12/27/17 16:37	

LABORATORY CONTROL SAMPLE: 534027

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.8	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 534028 534029

Parameter	Units	10414554001		534028		534029		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Total Organic Carbon	mg/L	3.7	25	25	28.0	28.0	97	97	80-120	0	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 534030 534031

Parameter	Units	10414554006		534030		534031		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Total Organic Carbon	mg/L	15.1	25	25	37.2	37.5	89	90	80-120	1	20

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414223

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

H1 Analysis conducted outside the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414223

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414223001	MW13S-GW-121117	RSK 175	513613		
10414223002	MARLOWW20-GW-121117	RSK 175	513613		
10414223003	MW22S-GW-121217	RSK 175	513613		
10414223001	MW13S-GW-121117	EPA 3010	513555	6010C Met	513727
10414223002	MARLOWW20-GW-121117	EPA 3010	513555	6010C Met	513727
10414223003	MW22S-GW-121217	EPA 3010	513555	6010C Met	513727
10414223001	MW13S-GW-121117	EPA 7470A	513554	EPA 7470A	513714
10414223002	MARLOWW20-GW-121117	EPA 7470A	513554	EPA 7470A	513714
10414223003	MW22S-GW-121217	EPA 7470A	513554	EPA 7470A	513714
10414223001	MW13S-GW-121117	SM 2320B	514065		
10414223002	MARLOWW20-GW-121117	SM 2320B	514065		
10414223003	MW22S-GW-121217	SM 2320B	514065		
10414223001	MW13S-GW-121117	SM 2540C	514330		
10414223002	MARLOWW20-GW-121117	SM 2540C	514330		
10414223003	MW22S-GW-121217	SM 2540C	514330		
10414223001	MW13S-GW-121117	SM 4500-S-2 D	96900		
10414223002	MARLOWW20-GW-121117	SM 4500-S-2 D	96900		
10414223003	MW22S-GW-121217	SM 4500-S-2 D	96900		
10414223001	MW13S-GW-121117	EPA 300.0	513428		
10414223002	MARLOWW20-GW-121117	EPA 300.0	513428		
10414223003	MW22S-GW-121217	EPA 300.0	513428		
10414223001	MW13S-GW-121117	EPA 353.2	513873		
10414223002	MARLOWW20-GW-121117	EPA 353.2	513873		
10414223003	MW22S-GW-121217	EPA 353.2	513873		
10414223001	MW13S-GW-121117	EPA 410.4	513838	EPA 410.4	513948
10414223002	MARLOWW20-GW-121117	EPA 410.4	513838	EPA 410.4	513948
10414223003	MW22S-GW-121217	EPA 410.4	513838	EPA 410.4	513948
10414223001	MW13S-GW-121117	SM 5310C	133711		
10414223002	MARLOWW20-GW-121117	SM 5310C	133711		
10414223003	MW22S-GW-121217	SM 5310C	133981		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10414223

### Section A

#### Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email:  
 Phone: | Fax:  
 Requested Due Date: **10 Day Standard**

### Section B

#### Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # PEDD# 1497-39-Rev1  
 Project Name: Freeman WA-Grain Handling Facility  
 Project #: 1497

### Section C

#### Invoice Information:

Attention: Anne Walsh  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447

Page : 1 Of 1

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -, ) Sample ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H2SO4 HNO3 HCl NaOH + Zn Acetate Other	Y/N	Requested Analysis Filtered (Y/N)										Regulatory Agency	
						START		END						Low Level VOCs by 8280	60107470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 6310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2		
						DATE	TIME	DATE	TIME																
1	MW13S-GW-12117	WTG		12/11/17	11:25					8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	601
2	MARLOW20-GW-12117	WTG		12/11/17	12:45					8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	002
3	MW225-GW-12127	WTG		12/17/17	9:50					8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	003
4																									
5																									
6																									
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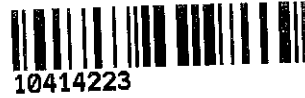
ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	Jamie Brown / CH2M	12/12/17	17:00	<i>Michelle Rece</i>	12/13/17	9:50	0.8	Y	Y	Y
*Field filtered by client										

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples intact (Y/N)
PRINT Name of SAMPLER:	Jamie Brown					
SIGNATURE of SAMPLER:	<i>Jamie Brown</i>	DATE Signed:	12/12/17			

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: CH2M

Project #: **WO# : 10414223**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 7448 1032 9720

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer  151401163

Used:  G87A9155100842

Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 0.7 Cooler Temp Corrected (°C): 0.8 Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: 12/13/17 MD

**USDA Regulated Soil** (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>No MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>time on sample #2 (ALL) says 1440</u> <u>time on sample #3 (ALL) says 1100</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N Sample # 1-3: <u>1/1</u> 1-3: <u>1/1</u> 1-3: <u>1/1</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, (TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: Lindsey Baumann Date/Time: 12/14/17

Comments/Resolution: Times are correct on the containers

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1130</u> Temp: <u>0.7</u>	Corrected Temp: <u>0.8</u>	
Time: <u>1150</u> put in cooler		
Time: _____ Temp: _____	Corrected Temp: _____	

not on the coc.

**Project Manager Review:**

Note: Whenever there is a discrepancy affecting North Carolina compli hold, incorrect preservative, out of temp, incorrect containers)

JENNI GROSS

Date: 12/13/17

irm will be sent to the North Carolina DEHNR Certification Office (i.e out of

Chain of Custody

WO#: 2067013



Analytical  
www.pacelabs.com

Workorder: 10414223      Workorder Name: 1497 Freeman WA-Grain Handling      Owner Received: 12/13/17      Results requested by: 12/28/2017

Report To		Subcontract To				Requested Analysis															
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333																			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					5636267 / 4500 Sulfide	LAB USE ONLY									
						Other															
1	MW13S-GW-121117	PS	12/11/2017 11:25	10414223001	Water	1					X										
2	MARLOWW20-GW-121117	PS	12/11/2017 12:45	10414223002	Water	1					X										
3	MW22S-GW-121217	PS	12/12/2017 09:50	10414223003	Water	1					X										
4																					
5																					

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	12/13/17	<i>[Signature]</i>		
2	<i>[Signature]</i>	12-14-17	<i>[Signature]</i>	12-14-17	1010
3					

Cooler Temperature on Receipt 2.1 °C      Custody Seal Y or N      Received on Ice Y or N      Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



Sample Condition Up

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

WO#: 2067013

PM: CMM

Due Date: 12/28/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS

DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12/14/17 JMB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

# Chain of Custody

**WO#: 12102493**

PM: HRZ Due Date: 12/28/17  
 CLIENT: PACE MPLS

Workorder: 10414223 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 12/13/2017 Results Requested By: 12/28/2017

Report To			Subcontract To				Requested Analysis																				
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426			Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																								
						Preserved Containers																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4																				LAB USE ONLY	
1	MW13S-GW-121117	PS	12/11/2017 11:25	10414223001	Water	1																					
2	MARLOWW20-GW-121117	PS	12/11/2017 12:45	10414223002	Water	1																					
3	MW22S-GW-121217	PS	12/12/2017 09:50	10414223003	Water	1																					
4																											
5																											
																				Comments							
Transfers	Released By	Date/Time	Received By	Date/Time																							
1	<i>[Signature]</i>	12/13/17	<i>B. Mathews</i>	09:52																							
2																											
3																											
Cooler Temperature on Receipt		0.9 °C	Custody Seal		<input checked="" type="radio"/> or N	Received on Ice		<input checked="" type="radio"/> or N	Samples Intact <input checked="" type="radio"/> or N																		

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt** Client Name: Pace Mpls

Courier:  Fed Ex  UPS  USPS  Other: ST

Commercial  Pace

Tracking Number: \_\_\_\_\_

**WO#: 12102493**

PM: HRZ Due Date: 12/28/17

CLIENT: PACE MPLS

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.6 Cooler Temp Corrected °C: 0.9 Biological Tissue Frozen?  Yes  No  NA

Temp should be above freezing to 6°C Correction Factor: 10.3 Date and Initials of Person Examining Contents: BM 12/14/17

Comments: \_\_\_\_\_

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Hunter 30 Date: 12/14/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

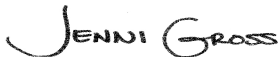
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414407

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414407

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414407001	Randall-GW-121217	Water	12/12/17 10:40	12/14/17 10:00
10414407002	Marlow-GW-121217	Water	12/12/17 14:00	12/14/17 10:00
10414407003	FD1-GW-121217	Water	12/12/17 12:00	12/14/17 10:00
10414407004	FD2-GW-121217	Water	12/12/17 12:00	12/14/17 10:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10414407001	Randall-GW-121217	RSK 175	DR1	3	PASI-M		
		6010C Met	BD1	22	PASI-M		
		EPA 7470A	LMW	1	PASI-M		
		SM 2320B	JFP	1	PASI-M		
		SM 2540C	NAS	1	PASI-M		
		SM 4500-S-2 D	MCT	1	PASI-N		
		EPA 300.0	KEO	3	PASI-M		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	DCL	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		
10414407002	Marlow-GW-121217	RSK 175	MJL	3	PASI-M		
		6010C Met	BD1	22	PASI-M		
		EPA 7470A	LMW	1	PASI-M		
		SM 2320B	JFP	1	PASI-M		
		SM 2540C	JFP	1	PASI-M		
		SM 4500-S-2 D	MCT	1	PASI-N		
		EPA 300.0	KEO	3	PASI-M		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	DCL	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		
10414407003	FD1-GW-121217	RSK 175	DR1	3	PASI-M		
		6010C Met	BD1	22	PASI-M		
		EPA 7470A	LMW	1	PASI-M		
		EPA 8260B	DJB	83	PASI-M		
		SM 4500-S-2 D	MCT	1	PASI-N		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	DCL	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		
		10414407004	FD2-GW-121217	RSK 175	DR1	3	PASI-M
				6010C Met	BD1	22	PASI-M
EPA 7470A	LMW			1	PASI-M		
EPA 8260B	DJB			83	PASI-M		
SM 2320B	JFP			1	PASI-M		
SM 2540C	NAS			1	PASI-M		
SM 4500-S-2 D	MCT			1	PASI-N		
EPA 300.0	KEO			3	PASI-M		
EPA 353.2	JFP			1	PASI-M		

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10414407001</b>	<b>Randall-GW-121217</b>					
RSK 175	Methane	4.3J	ug/L	10.0	12/15/17 13:08	
6010C Met	Barium, Dissolved	20.5	ug/L	10.0	12/27/17 20:32	
6010C Met	Calcium, Dissolved	41800	ug/L	500	12/27/17 20:32	
6010C Met	Copper, Dissolved	11.1	ug/L	10.0	12/27/17 20:32	
6010C Met	Magnesium, Dissolved	13000	ug/L	500	12/27/17 20:32	
6010C Met	Manganese, Dissolved	1.1J	ug/L	5.0	12/27/17 20:32	
6010C Met	Potassium, Dissolved	1280J	ug/L	2500	12/27/17 20:32	
6010C Met	Sodium, Dissolved	13000	ug/L	1000	12/27/17 20:32	
6010C Met	Thallium, Dissolved	9.8J	ug/L	20.0	12/27/17 20:32	
6010C Met	Vanadium, Dissolved	5.0J	ug/L	15.0	12/27/17 20:32	
6010C Met	Zinc, Dissolved	186	ug/L	20.0	12/27/17 20:32	
SM 2320B	Alkalinity, Total as CaCO3	176	mg/L	5.0	12/16/17 15:34	
SM 2540C	Total Dissolved Solids	257	mg/L	10.0	12/18/17 16:02	
EPA 300.0	Chloride	5.5	mg/L	1.2	12/14/17 15:08	M1
EPA 300.0	Nitrate as N	2.5	mg/L	0.10	12/14/17 15:08	M1
EPA 300.0	Sulfate	9.9	mg/L	1.2	12/14/17 15:08	M1
EPA 353.2	Nitrogen, NO2 plus NO3	2.6	mg/L	0.040	12/15/17 12:44	
SM 5310C	Total Organic Carbon	0.26J	mg/L	1.0	12/19/17 02:35	
<b>10414407002</b>	<b>Marlow-GW-121217</b>					
RSK 175	Methane	4.6J	ug/L	10.0	12/15/17 14:55	
6010C Met	Barium, Dissolved	29.1	ug/L	10.0	12/27/17 20:51	
6010C Met	Calcium, Dissolved	45400	ug/L	500	12/27/17 20:51	
6010C Met	Copper, Dissolved	29.3	ug/L	10.0	12/27/17 20:51	
6010C Met	Magnesium, Dissolved	12900	ug/L	500	12/27/17 20:51	
6010C Met	Potassium, Dissolved	1340J	ug/L	2500	12/27/17 20:51	
6010C Met	Sodium, Dissolved	11900	ug/L	1000	12/27/17 20:51	
6010C Met	Thallium, Dissolved	4.9J	ug/L	20.0	12/27/17 20:51	
6010C Met	Vanadium, Dissolved	7.9J	ug/L	15.0	12/27/17 20:51	
6010C Met	Zinc, Dissolved	45.3	ug/L	20.0	12/27/17 20:51	
SM 2320B	Alkalinity, Total as CaCO3	155	mg/L	5.0	12/16/17 15:56	
SM 2540C	Total Dissolved Solids	257	mg/L	10.0	12/19/17 16:02	
EPA 300.0	Chloride	15.1	mg/L	1.2	12/14/17 14:05	M1
EPA 300.0	Nitrate as N	4.0	mg/L	0.10	12/14/17 14:05	M1
EPA 300.0	Sulfate	13.4	mg/L	1.2	12/14/17 14:05	M1
EPA 353.2	Nitrogen, NO2 plus NO3	4.2	mg/L	0.10	12/23/17 14:59	
SM 5310C	Total Organic Carbon	0.56J	mg/L	1.0	12/18/17 16:50	
<b>10414407003</b>	<b>FD1-GW-121217</b>					
RSK 175	Methane	3.6J	ug/L	10.0	12/15/17 13:52	
6010C Met	Barium, Dissolved	20.8	ug/L	10.0	12/27/17 21:18	
6010C Met	Calcium, Dissolved	42100	ug/L	500	12/27/17 21:18	
6010C Met	Copper, Dissolved	11.4	ug/L	10.0	12/27/17 21:18	
6010C Met	Magnesium, Dissolved	13100	ug/L	500	12/27/17 21:18	
6010C Met	Manganese, Dissolved	0.92J	ug/L	5.0	12/27/17 21:18	
6010C Met	Potassium, Dissolved	1320J	ug/L	2500	12/27/17 21:18	
6010C Met	Sodium, Dissolved	13200	ug/L	1000	12/27/17 21:18	
6010C Met	Thallium, Dissolved	7.2J	ug/L	20.0	12/27/17 21:18	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414407003</b>	<b>FD1-GW-121217</b>					
6010C Met	Vanadium, Dissolved	5.2J	ug/L	15.0	12/27/17 21:18	
6010C Met	Zinc, Dissolved	186	ug/L	20.0	12/27/17 21:18	
EPA 8260B	Carbon disulfide	2.5	ug/L	2.0	12/19/17 08:50	
EPA 8260B	Carbon tetrachloride	292	ug/L	1.0	12/19/17 08:50	
EPA 8260B	Chloroform	9.9	ug/L	2.0	12/19/17 08:50	
EPA 353.2	Nitrogen, NO2 plus NO3	2.6	mg/L	0.040	12/15/17 12:50	
SM 5310C	Total Organic Carbon	0.32J	mg/L	1.0	12/18/17 17:32	
<b>10414407004</b>	<b>FD2-GW-121217</b>					
RSK 175	Methane	2.9J	ug/L	10.0	12/15/17 13:59	
6010C Met	Barium, Dissolved	29.9	ug/L	10.0	12/27/17 21:22	
6010C Met	Calcium, Dissolved	44900	ug/L	500	12/27/17 21:22	
6010C Met	Copper, Dissolved	66.4	ug/L	10.0	12/27/17 21:22	
6010C Met	Iron, Dissolved	17.2J	ug/L	50.0	12/27/17 21:22	
6010C Met	Magnesium, Dissolved	12800	ug/L	500	12/27/17 21:22	
6010C Met	Manganese, Dissolved	0.47J	ug/L	5.0	12/27/17 21:22	
6010C Met	Potassium, Dissolved	1320J	ug/L	2500	12/27/17 21:22	
6010C Met	Sodium, Dissolved	11900	ug/L	1000	12/27/17 21:22	
6010C Met	Thallium, Dissolved	5.0J	ug/L	20.0	12/27/17 21:22	
6010C Met	Vanadium, Dissolved	7.7J	ug/L	15.0	12/27/17 21:22	
6010C Met	Zinc, Dissolved	79.4	ug/L	20.0	12/27/17 21:22	
EPA 8260B	Carbon disulfide	0.71J	ug/L	1.0	12/16/17 05:02	
EPA 8260B	Carbon tetrachloride	139	ug/L	0.50	12/16/17 05:02	
EPA 8260B	Chloroform	8.3	ug/L	1.0	12/16/17 05:02	
SM 2320B	Alkalinity, Total as CaCO3	161	mg/L	5.0	12/16/17 16:09	
SM 2540C	Total Dissolved Solids	276	mg/L	10.0	12/18/17 16:02	
EPA 300.0	Chloride	15.3	mg/L	1.2	12/14/17 16:11	
EPA 300.0	Nitrate as N	4.1	mg/L	0.10	12/14/17 16:11	
EPA 300.0	Sulfate	13.6	mg/L	1.2	12/14/17 16:11	
EPA 353.2	Nitrogen, NO2 plus NO3	4.2	mg/L	0.10	12/15/17 12:51	
SM 5310C	Total Organic Carbon	0.56J	mg/L	1.0	12/18/17 17:46	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- FD1-GW-121217 (Lab ID: 10414407003)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 513906

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414412001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2794630)
  - Acetone
  - Carbon tetrachloride
- MSD (Lab ID: 2794631)
  - Acetone
  - Carbon tetrachloride
  - Chloroform

QC Batch: 514230

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 97062

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2066893001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 417760)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 513604

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s):  
10414278001,10414407001,10414407002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2792866)
  - Chloride
  - Nitrate as N
  - Sulfate
- MS (Lab ID: 2793351)
  - Chloride
  - Nitrate as N
  - Sulfate
- MS (Lab ID: 2793353)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2792867)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2793352)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2793354)
  - Chloride
  - Nitrate as N
  - Sulfate

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 513873

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2794481)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2794482)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

4 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

**Sample: Randall-GW-121217**      **Lab ID: 10414407001**      Collected: 12/12/17 10:40      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/15/17 13:08	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/15/17 13:08	74-85-1	
Methane	4.3J	ug/L	10.0	1.1	1		12/15/17 13:08	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 20:32	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 20:32	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 20:32	7440-38-2	
Barium, Dissolved	20.5	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 20:32	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 20:32	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 20:32	7440-43-9	
Calcium, Dissolved	41800	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 20:32	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 20:32	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 20:32	7440-48-4	
Copper, Dissolved	11.1	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 20:32	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 20:32	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 20:32	7439-92-1	
Magnesium, Dissolved	13000	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 20:32	7439-95-4	
Manganese, Dissolved	1.1J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 20:32	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 20:32	7440-02-0	
Potassium, Dissolved	1280J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 20:32	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 20:32	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 20:32	7440-22-4	
Sodium, Dissolved	13000	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 20:32	7440-23-5	
Thallium, Dissolved	9.8J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 20:32	7440-28-0	
Vanadium, Dissolved	5.0J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 20:32	7440-62-2	
Zinc, Dissolved	186	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 20:32	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 16:59	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	176	mg/L	5.0	1.4	1		12/16/17 15:34		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	257	mg/L	10.0	5.0	1		12/18/17 16:02		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/18/17 10:10	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.5	mg/L	1.2	0.14	1		12/14/17 15:08	16887-00-6	M1
Nitrate as N	2.5	mg/L	0.10	0.0079	1		12/14/17 15:08	14797-55-8	M1
Sulfate	9.9	mg/L	1.2	0.27	1		12/14/17 15:08	14808-79-8	M1

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Sample: Randall-GW-121217**      **Lab ID: 10414407001**      Collected: 12/12/17 10:40      Received: 12/14/17 10:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>2.6</b>	mg/L	0.040	0.015	2		12/15/17 12:44		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:15		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.26J</b>	mg/L	1.0	0.20	1		12/19/17 02:35	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

**Sample: Marlow-GW-121217**      **Lab ID: 10414407002**      Collected: 12/12/17 14:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/15/17 14:55	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/15/17 14:55	74-85-1	
Methane	4.6J	ug/L	10.0	1.1	1		12/15/17 14:55	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 20:51	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 20:51	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 20:51	7440-38-2	
Barium, Dissolved	29.1	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 20:51	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 20:51	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 20:51	7440-43-9	
Calcium, Dissolved	45400	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 20:51	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 20:51	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 20:51	7440-48-4	
Copper, Dissolved	29.3	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 20:51	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 20:51	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 20:51	7439-92-1	
Magnesium, Dissolved	12900	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 20:51	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 20:51	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 20:51	7440-02-0	
Potassium, Dissolved	1340J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 20:51	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 20:51	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 20:51	7440-22-4	
Sodium, Dissolved	11900	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 20:51	7440-23-5	
Thallium, Dissolved	4.9J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 20:51	7440-28-0	
Vanadium, Dissolved	7.9J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 20:51	7440-62-2	
Zinc, Dissolved	45.3	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 20:51	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:06	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	155	mg/L	5.0	1.4	1		12/16/17 15:56		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	257	mg/L	10.0	5.0	1		12/19/17 16:02		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/18/17 10:10	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	15.1	mg/L	1.2	0.14	1		12/14/17 14:05	16887-00-6	M1
Nitrate as N	4.0	mg/L	0.10	0.0079	1		12/14/17 14:05	14797-55-8	M1
Sulfate	13.4	mg/L	1.2	0.27	1		12/14/17 14:05	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Sample: Marlow-GW-121217**      **Lab ID: 10414407002**      Collected: 12/12/17 14:00      Received: 12/14/17 10:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.2</b>	mg/L	0.10	0.037	5		12/23/17 14:59		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:17		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.56J</b>	mg/L	1.0	0.20	1		12/18/17 16:50	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414407

**Sample:** FD1-GW-121217      **Lab ID:** 10414407003      Collected: 12/12/17 12:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/15/17 13:52	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/15/17 13:52	74-85-1	
Methane	3.6J	ug/L	10.0	1.1	1		12/15/17 13:52	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:18	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:18	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:18	7440-38-2	
Barium, Dissolved	20.8	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:18	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:18	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:18	7440-43-9	
Calcium, Dissolved	42100	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:18	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:18	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:18	7440-48-4	
Copper, Dissolved	11.4	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:18	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:18	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:18	7439-92-1	
Magnesium, Dissolved	13100	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:18	7439-95-4	
Manganese, Dissolved	0.92J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:18	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:18	7440-02-0	
Potassium, Dissolved	1320J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:18	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:18	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:18	7440-22-4	
Sodium, Dissolved	13200	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:18	7440-23-5	
Thallium, Dissolved	7.2J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:18	7440-28-0	
Vanadium, Dissolved	5.2J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:18	7440-62-2	
Zinc, Dissolved	186	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:18	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:18	7439-97-6	
<b>8260B MSV Low Level</b> Analytical Method: EPA 8260B									
1,1,1,2-Tetrachloroethane	<0.29	ug/L	1.0	0.29	2		12/19/17 08:50	630-20-6	
1,1,1-Trichloroethane	<0.30	ug/L	1.0	0.30	2		12/19/17 08:50	71-55-6	
1,1,2,2-Tetrachloroethane	<0.38	ug/L	1.0	0.38	2		12/19/17 08:50	79-34-5	
1,1,2-Trichloroethane	<0.44	ug/L	1.0	0.44	2		12/19/17 08:50	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.55	ug/L	2.0	0.55	2		12/19/17 08:50	76-13-1	
1,1-Dichloroethane	<0.29	ug/L	1.0	0.29	2		12/19/17 08:50	75-34-3	
1,1-Dichloroethene	<0.36	ug/L	1.0	0.36	2		12/19/17 08:50	75-35-4	
1,1-Dichloropropene	<0.35	ug/L	1.0	0.35	2		12/19/17 08:50	563-58-6	
1,2,3-Trichlorobenzene	<0.29	ug/L	1.0	0.29	2		12/19/17 08:50	87-61-6	
1,2,3-Trichloropropane	<1.3	ug/L	8.0	1.3	2		12/19/17 08:50	96-18-4	
1,2,4-Trichlorobenzene	<0.36	ug/L	1.0	0.36	2		12/19/17 08:50	120-82-1	
1,2,4-Trimethylbenzene	<0.20	ug/L	1.0	0.20	2		12/19/17 08:50	95-63-6	
1,2-Dibromo-3-chloropropane	<2.1	ug/L	8.0	2.1	2		12/19/17 08:50	96-12-8	
1,2-Dibromoethane (EDB)	<0.34	ug/L	1.0	0.34	2		12/19/17 08:50	106-93-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Sample: **FD1-GW-121217** Lab ID: **10414407003** Collected: 12/12/17 12:00 Received: 12/14/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.42	ug/L	1.0	0.42	2		12/19/17 08:50	95-50-1	
1,2-Dichloroethane	<0.30	ug/L	1.0	0.30	2		12/19/17 08:50	107-06-2	
1,2-Dichloroethene (Total)	<0.82	ug/L	2.0	0.82	2		12/19/17 08:50	540-59-0	
1,2-Dichloropropane	<1.2	ug/L	8.0	1.2	2		12/19/17 08:50	78-87-5	
1,3,5-Trimethylbenzene	<0.36	ug/L	1.0	0.36	2		12/19/17 08:50	108-67-8	
1,3-Dichlorobenzene	<0.32	ug/L	1.0	0.32	2		12/19/17 08:50	541-73-1	
1,3-Dichloropropane	<0.26	ug/L	1.0	0.26	2		12/19/17 08:50	142-28-9	
1,4-Dichlorobenzene	<0.21	ug/L	1.0	0.21	2		12/19/17 08:50	106-46-7	
1,4-Dioxane (p-Dioxane)	<45.2	ug/L	400	45.2	2		12/19/17 08:50	123-91-1	
2,2,4-Trimethylpentane	<2.6	ug/L	8.0	2.6	2		12/19/17 08:50	540-84-1	
2,2-Dichloropropane	<0.79	ug/L	2.0	0.79	2		12/19/17 08:50	594-20-7	
2-Butanone (MEK)	<4.8	ug/L	10.0	4.8	2		12/19/17 08:50	78-93-3	
2-Chlorotoluene	<0.41	ug/L	1.0	0.41	2		12/19/17 08:50	95-49-8	
2-Hexanone	<5.0	ug/L	10.0	5.0	2		12/19/17 08:50	591-78-6	
4-Chlorotoluene	<0.26	ug/L	1.0	0.26	2		12/19/17 08:50	106-43-4	
4-Methyl-2-pentanone (MIBK)	<1.1	ug/L	10.0	1.1	2		12/19/17 08:50	108-10-1	
Acetone	<17.7	ug/L	40.0	17.7	2		12/19/17 08:50	67-64-1	
Acrolein	<9.7	ug/L	20.0	9.7	2		12/19/17 08:50	107-02-8	
Acrylonitrile	<9.8	ug/L	20.0	9.8	2		12/19/17 08:50	107-13-1	
Benzene	<0.25	ug/L	1.0	0.25	2		12/19/17 08:50	71-43-2	
Bromobenzene	<0.31	ug/L	1.0	0.31	2		12/19/17 08:50	108-86-1	
Bromochloromethane	<0.76	ug/L	2.0	0.76	2		12/19/17 08:50	74-97-5	
Bromodichloromethane	<0.40	ug/L	1.0	0.40	2		12/19/17 08:50	75-27-4	
Bromoform	<2.1	ug/L	8.0	2.1	2		12/19/17 08:50	75-25-2	
Bromomethane	<3.1	ug/L	8.0	3.1	2		12/19/17 08:50	74-83-9	
Carbon disulfide	2.5	ug/L	2.0	0.74	2		12/19/17 08:50	75-15-0	
Carbon tetrachloride	292	ug/L	1.0	0.40	2		12/19/17 08:50	56-23-5	
Chlorobenzene	<0.27	ug/L	1.0	0.27	2		12/19/17 08:50	108-90-7	
Chloroethane	<0.88	ug/L	2.0	0.88	2		12/19/17 08:50	75-00-3	
Chloroform	9.9	ug/L	2.0	0.92	2		12/19/17 08:50	67-66-3	
Chloromethane	<2.2	ug/L	8.0	2.2	2		12/19/17 08:50	74-87-3	
Dibromochloromethane	<0.27	ug/L	1.0	0.27	2		12/19/17 08:50	124-48-1	
Dibromomethane	<1.0	ug/L	2.0	1.0	2		12/19/17 08:50	74-95-3	
Dichlorodifluoromethane	<0.63	ug/L	2.0	0.63	2		12/19/17 08:50	75-71-8	
Dichlorofluoromethane	<0.77	ug/L	2.0	0.77	2		12/19/17 08:50	75-43-4	
Diisopropyl ether	<0.25	ug/L	2.0	0.25	2		12/19/17 08:50	108-20-3	
Ethyl-tert-butyl ether	<0.26	ug/L	1.0	0.26	2		12/19/17 08:50	637-92-3	
Ethylbenzene	<0.27	ug/L	1.0	0.27	2		12/19/17 08:50	100-41-4	
Hexachloro-1,3-butadiene	<0.96	ug/L	2.0	0.96	2		12/19/17 08:50	87-68-3	
Isopropylbenzene (Cumene)	<0.28	ug/L	1.0	0.28	2		12/19/17 08:50	98-82-8	
Methyl-tert-butyl ether	<0.29	ug/L	1.0	0.29	2		12/19/17 08:50	1634-04-4	
Methylene Chloride	<2.3	ug/L	8.0	2.3	2		12/19/17 08:50	75-09-2	
Naphthalene	<0.84	ug/L	2.0	0.84	2		12/19/17 08:50	91-20-3	
Styrene	<0.29	ug/L	1.0	0.29	2		12/19/17 08:50	100-42-5	
Tetrachloroethene	<0.32	ug/L	1.0	0.32	2		12/19/17 08:50	127-18-4	
Tetrahydrofuran	<8.6	ug/L	20.0	8.6	2		12/19/17 08:50	109-99-9	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

**Sample:** FD1-GW-121217      **Lab ID:** 10414407003      Collected: 12/12/17 12:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<0.34	ug/L	1.0	0.34	2		12/19/17 08:50	108-88-3	
Trichloroethene	<0.36	ug/L	0.80	0.36	2		12/19/17 08:50	79-01-6	
Trichlorofluoromethane	<0.26	ug/L	1.0	0.26	2		12/19/17 08:50	75-69-4	
Vinyl acetate	<3.0	ug/L	20.0	3.0	2		12/19/17 08:50	108-05-4	L2
Vinyl chloride	<0.19	ug/L	0.40	0.19	2		12/19/17 08:50	75-01-4	
Xylene (Total)	<0.49	ug/L	3.0	0.49	2		12/19/17 08:50	1330-20-7	
cis-1,2-Dichloroethene	<0.40	ug/L	1.0	0.40	2		12/19/17 08:50	156-59-2	
cis-1,3-Dichloropropene	<0.23	ug/L	1.0	0.23	2		12/19/17 08:50	10061-01-5	
m&p-Xylene	<0.49	ug/L	2.0	0.49	2		12/19/17 08:50	179601-23-1	
n-Butylbenzene	<0.27	ug/L	1.0	0.27	2		12/19/17 08:50	104-51-8	
n-Propylbenzene	<0.25	ug/L	1.0	0.25	2		12/19/17 08:50	103-65-1	
o-Xylene	<0.22	ug/L	1.0	0.22	2		12/19/17 08:50	95-47-6	
p-Isopropyltoluene	<0.28	ug/L	1.0	0.28	2		12/19/17 08:50	99-87-6	
sec-Butylbenzene	<0.25	ug/L	1.0	0.25	2		12/19/17 08:50	135-98-8	
tert-Amylmethyl ether	<0.23	ug/L	1.0	0.23	2		12/19/17 08:50	994-05-8	
tert-Butyl Alcohol	<4.4	ug/L	20.0	4.4	2		12/19/17 08:50	75-65-0	
tert-Butylbenzene	<0.29	ug/L	1.0	0.29	2		12/19/17 08:50	98-06-6	
trans-1,2-Dichloroethene	<0.42	ug/L	1.0	0.42	2		12/19/17 08:50	156-60-5	
trans-1,3-Dichloropropene	<0.27	ug/L	1.0	0.27	2		12/19/17 08:50	10061-02-6	
trans-1,4-Dichloro-2-butene	<5.7	ug/L	20.0	5.7	2		12/19/17 08:50	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		2		12/19/17 08:50	17060-07-0	
Toluene-d8 (S)	97	%	75-125		2		12/19/17 08:50	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		2		12/19/17 08:50	460-00-4	
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/18/17 10:11	18496-25-8	
<b>353.2 Nitrate + Nitrite</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	2.6	mg/L	0.040	0.015	2		12/15/17 12:50		
<b>410.4 COD</b>		Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:18		
<b>5310C TOC</b>		Analytical Method: SM 5310C							
Total Organic Carbon	0.32J	mg/L	1.0	0.20	1		12/18/17 17:32	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414407

**Sample:** FD2-GW-121217      **Lab ID:** 10414407004      Collected: 12/12/17 12:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/15/17 13:59	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/15/17 13:59	74-85-1	
Methane	2.9J	ug/L	10.0	1.1	1		12/15/17 13:59	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:22	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:22	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:22	7440-38-2	
Barium, Dissolved	29.9	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:22	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:22	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:22	7440-43-9	
Calcium, Dissolved	44900	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:22	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:22	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:22	7440-48-4	
Copper, Dissolved	66.4	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:22	7440-50-8	
Iron, Dissolved	17.2J	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:22	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:22	7439-92-1	
Magnesium, Dissolved	12800	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:22	7439-95-4	
Manganese, Dissolved	0.47J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:22	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:22	7440-02-0	
Potassium, Dissolved	1320J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:22	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:22	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:22	7440-22-4	
Sodium, Dissolved	11900	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:22	7440-23-5	
Thallium, Dissolved	5.0J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:22	7440-28-0	
Vanadium, Dissolved	7.7J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:22	7440-62-2	
Zinc, Dissolved	79.4	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:22	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:20	7439-97-6	
<b>8260B MSV Low Level</b> Analytical Method: EPA 8260B									
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 05:02	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 05:02	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 05:02	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 05:02	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 05:02	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 05:02	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 05:02	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 05:02	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/16/17 05:02	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 05:02	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 05:02	106-93-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Sample: **FD2-GW-121217** Lab ID: **10414407004** Collected: 12/12/17 12:00 Received: 12/14/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 05:02	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 05:02	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 05:02	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 05:02	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 05:02	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 05:02	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 05:02	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 05:02	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 05:02	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 05:02	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 05:02	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 05:02	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 05:02	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 05:02	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 05:02	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 05:02	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 05:02	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 05:02	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 05:02	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 05:02	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 05:02	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 05:02	74-83-9	
Carbon disulfide	<b>0.71J</b>	ug/L	1.0	0.37	1		12/16/17 05:02	75-15-0	
Carbon tetrachloride	<b>139</b>	ug/L	0.50	0.20	1		12/16/17 05:02	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 05:02	75-00-3	
Chloroform	<b>8.3</b>	ug/L	1.0	0.46	1		12/16/17 05:02	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 05:02	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	124-48-1	
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 05:02	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 05:02	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 05:02	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 05:02	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 05:02	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 05:02	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 05:02	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 05:02	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 05:02	109-99-9	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

**Sample:** FD2-GW-121217      **Lab ID:** 10414407004      Collected: 12/12/17 12:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 05:02	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 05:02	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 05:02	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 05:02	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 05:02	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 05:02	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 05:02	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 05:02	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 05:02	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 05:02	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 05:02	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 05:02	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 05:02	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 05:02	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 05:02	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 05:02	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 05:02	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 05:02	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		12/16/17 05:02	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		12/16/17 05:02	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1		12/16/17 05:02	460-00-4	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	161	mg/L	5.0	1.4	1		12/16/17 16:09		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	276	mg/L	10.0	5.0	1		12/18/17 16:02		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/18/17 10:11	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	15.3	mg/L	1.2	0.14	1		12/14/17 16:11	16887-00-6	
Nitrate as N	4.1	mg/L	0.10	0.0079	1		12/14/17 16:11	14797-55-8	
Sulfate	13.6	mg/L	1.2	0.27	1		12/14/17 16:11	14808-79-8	
<b>353.2 Nitrate + Nitrite</b>		Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	4.2	mg/L	0.10	0.037	5		12/15/17 12:51		
<b>410.4 COD</b>		Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	12/15/17 09:55	12/15/17 13:19		

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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**Sample: FD2-GW-121217**      **Lab ID: 10414407004**      Collected: 12/12/17 12:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.56J</b>	mg/L	1.0	0.20	1		12/18/17 17:46	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 513866 Analysis Method: RSK 175  
 QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
 Associated Lab Samples: 10414407001, 10414407003, 10414407004

METHOD BLANK: 2794450 Matrix: Water

Associated Lab Samples: 10414407001, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/15/17 13:01	
Ethene	ug/L	<0.68	10.0	0.68	12/15/17 13:01	
Methane	ug/L	4.2J	10.0	1.1	12/15/17 13:01	

LABORATORY CONTROL SAMPLE & LCSD: 2794451 2794452

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	102	106	90	93	85-115	3	20	
Ethene	ug/L	106	95.8	98.5	90	93	85-115	3	20	
Methane	ug/L	60.7	53.8	55.4	89	91	85-115	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794453 2794454

Parameter	Units	10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	91.1	99.8	80	87	30-150	9	20	
Ethene	ug/L	<0.68	106	106	85.1	92.8	80	88	30-150	9	20	
Methane	ug/L	4.3J	60.7	60.7	49.6	54.1	75	82	30-150	9	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414407

QC Batch: 514040 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10414407002

METHOD BLANK: 2795669 Matrix: Water  
Associated Lab Samples: 10414407002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/15/17 14:48	
Ethene	ug/L	<0.68	10.0	0.68	12/15/17 14:48	
Methane	ug/L	4.1J	10.0	1.1	12/15/17 14:48	

LABORATORY CONTROL SAMPLE & LCSD: 2795670

Parameter	Units	2795671								Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD			
Ethane	ug/L	114	106	107	93	94	85-115	1	20		
Ethene	ug/L	106	98.5	100	93	94	85-115	2	20		
Methane	ug/L	60.7	55.4	56.9	91	94	85-115	3	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794455

Parameter	Units	2794456										
		10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	89.7	88.1	79	77	30-150	2	20	
Ethene	ug/L	<0.68	106	106	84.1	82.8	79	78	30-150	2	20	
Methane	ug/L	4.6J	60.7	60.7	48.4	47.6	72	71	30-150	2	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 514122 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

METHOD BLANK: 2796191 Matrix: Water  
 Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	12/27/17 16:55	

LABORATORY CONTROL SAMPLE: 2796192

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796193 2796194

Parameter	Units	10414407001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Mercury, Dissolved	ug/L	<0.062	5	5	5.4	5.6	107	112	80-120	4	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796195 2796196

Parameter	Units	10414407002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Mercury, Dissolved	ug/L	<0.062	5	5	5.2	5.4	105	108	80-120	3	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 514108

Analysis Method: 6010C Met

QC Batch Method: EPA 3010

Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

METHOD BLANK: 2796133

Matrix: Water

Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	12/27/17 20:24	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	12/27/17 20:24	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	12/27/17 20:24	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	12/27/17 20:24	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	12/27/17 20:24	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	12/27/17 20:24	
Calcium, Dissolved	ug/L	<24.7	500	24.7	12/27/17 20:24	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	12/27/17 20:24	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	12/27/17 20:24	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	12/27/17 20:24	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	12/27/17 20:24	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	12/27/17 20:24	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	12/27/17 20:24	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	12/27/17 20:24	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	12/27/17 20:24	
Potassium, Dissolved	ug/L	<126	2500	126	12/27/17 20:24	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	12/27/17 20:24	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	12/27/17 20:24	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	12/27/17 20:24	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	12/27/17 20:24	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	12/27/17 20:24	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	12/27/17 20:24	

LABORATORY CONTROL SAMPLE: 2796134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19500	97	80-120	
Antimony, Dissolved	ug/L	1000	939	94	80-120	
Arsenic, Dissolved	ug/L	1000	916	92	80-120	
Barium, Dissolved	ug/L	1000	930	93	80-120	
Beryllium, Dissolved	ug/L	1000	943	94	80-120	
Cadmium, Dissolved	ug/L	1000	911	91	80-120	
Calcium, Dissolved	ug/L	20000	17600	88	80-120	
Chromium, Dissolved	ug/L	1000	922	92	80-120	
Cobalt, Dissolved	ug/L	1000	916	92	80-120	
Copper, Dissolved	ug/L	1000	885	88	80-120	
Iron, Dissolved	ug/L	20000	18200	91	80-120	
Lead, Dissolved	ug/L	1000	924	92	80-120	
Magnesium, Dissolved	ug/L	20000	17900	89	80-120	
Manganese, Dissolved	ug/L	1000	934	93	80-120	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

LABORATORY CONTROL SAMPLE: 2796134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	927	93	80-120	
Potassium, Dissolved	ug/L	20000	18000	90	80-120	
Selenium, Dissolved	ug/L	1000	972	97	80-120	
Silver, Dissolved	ug/L	500	443	89	80-120	
Sodium, Dissolved	ug/L	20000	18100	91	80-120	
Thallium, Dissolved	ug/L	1000	909	91	80-120	
Vanadium, Dissolved	ug/L	1000	874	87	80-120	
Zinc, Dissolved	ug/L	1000	933	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796135 2796136

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407001 Result	Spike Conc.	Spike Conc.	Result								
Aluminum, Dissolved	ug/L	<8.6	20000	20000	20200	19700	101	99	75-125	2	20		
Antimony, Dissolved	ug/L	<3.1	1000	1000	974	954	97	95	75-125	2	20		
Arsenic, Dissolved	ug/L	<5.2	1000	1000	947	935	95	94	75-125	1	20		
Barium, Dissolved	ug/L	20.5	1000	1000	976	961	96	94	75-125	2	20		
Beryllium, Dissolved	ug/L	<0.11	1000	1000	970	959	97	96	75-125	1	20		
Cadmium, Dissolved	ug/L	<0.46	1000	1000	934	920	93	92	75-125	2	20		
Calcium, Dissolved	ug/L	41800	20000	20000	60800	60400	95	93	75-125	1	20		
Chromium, Dissolved	ug/L	<0.50	1000	1000	944	932	94	93	75-125	1	20		
Cobalt, Dissolved	ug/L	<1.1	1000	1000	924	910	92	91	75-125	2	20		
Copper, Dissolved	ug/L	11.1	1000	1000	927	912	92	90	75-125	2	20		
Iron, Dissolved	ug/L	<16.7	20000	20000	18800	18400	94	92	75-125	2	20		
Lead, Dissolved	ug/L	<3.0	1000	1000	937	925	94	92	75-125	1	20		
Magnesium, Dissolved	ug/L	13000	20000	20000	31900	31600	95	93	75-125	1	20		
Manganese, Dissolved	ug/L	1.1J	1000	1000	952	939	95	94	75-125	1	20		
Nickel, Dissolved	ug/L	<1.1	1000	1000	929	917	93	92	75-125	1	20		
Potassium, Dissolved	ug/L	1280J	20000	20000	20500	20100	96	94	75-125	2	20		
Selenium, Dissolved	ug/L	<6.4	1000	1000	987	961	99	96	75-125	3	20		
Silver, Dissolved	ug/L	<0.27	500	500	456	451	91	90	75-125	1	20		
Sodium, Dissolved	ug/L	13000	20000	20000	32000	31400	95	92	75-125	2	20		
Thallium, Dissolved	ug/L	9.8J	1000	1000	942	925	93	92	75-125	2	20		
Vanadium, Dissolved	ug/L	5.0J	1000	1000	903	891	90	89	75-125	1	20		
Zinc, Dissolved	ug/L	186	1000	1000	1110	1100	93	92	75-125	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796137 2796138

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407002 Result	Spike Conc.	Spike Conc.	Result								
Aluminum, Dissolved	ug/L	<8.6	20000	20000	19900	19800	99	99	75-125	0	20		
Antimony, Dissolved	ug/L	<3.1	1000	1000	944	949	94	95	75-125	1	20		
Arsenic, Dissolved	ug/L	<5.2	1000	1000	941	933	94	93	75-125	1	20		
Barium, Dissolved	ug/L	29.1	1000	1000	976	971	95	94	75-125	1	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Parameter	Units	2796137		2796138		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Beryllium, Dissolved	ug/L	<0.11	1000	1000	967	960	97	96	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	927	920	93	92	75-125	1	20	
Calcium, Dissolved	ug/L	45400	20000	20000	63400	63100	90	88	75-125	1	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	939	933	94	93	75-125	1	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	913	910	91	91	75-125	0	20	
Copper, Dissolved	ug/L	29.3	1000	1000	934	932	90	90	75-125	0	20	
Iron, Dissolved	ug/L	<16.7	20000	20000	18500	18400	93	92	75-125	0	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	928	923	93	92	75-125	1	20	
Magnesium, Dissolved	ug/L	12900	20000	20000	31300	31200	92	92	75-125	0	20	
Manganese, Dissolved	ug/L	<0.38	1000	1000	943	938	94	94	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	921	915	92	91	75-125	1	20	
Potassium, Dissolved	ug/L	1340J	20000	20000	20300	20300	95	95	75-125	0	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	978	976	98	98	75-125	0	20	
Silver, Dissolved	ug/L	<0.27	500	500	453	450	91	90	75-125	1	20	
Sodium, Dissolved	ug/L	11900	20000	20000	30500	30400	93	92	75-125	0	20	
Thallium, Dissolved	ug/L	4.9J	1000	1000	936	929	93	92	75-125	1	20	
Vanadium, Dissolved	ug/L	7.9J	1000	1000	895	890	89	88	75-125	1	20	
Zinc, Dissolved	ug/L	45.3	1000	1000	971	960	93	91	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 513906

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10414407004

METHOD BLANK: 2794628

Matrix: Water

Associated Lab Samples: 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/16/17 01:31	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/16/17 01:31	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/16/17 01:31	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/16/17 01:31	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/16/17 01:31	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/16/17 01:31	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/16/17 01:31	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/16/17 01:31	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/16/17 01:31	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/16/17 01:31	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/16/17 01:31	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/16/17 01:31	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/16/17 01:31	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/16/17 01:31	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/16/17 01:31	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/16/17 01:31	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/16/17 01:31	
Acetone	ug/L	<8.8	20.0	8.8	12/16/17 01:31	
Acrolein	ug/L	<4.8	10.0	4.8	12/16/17 01:31	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/16/17 01:31	
Benzene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/16/17 01:31	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
Bromoform	ug/L	<1.0	4.0	1.0	12/16/17 01:31	
Bromomethane	ug/L	<1.5	4.0	1.5	12/16/17 01:31	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/16/17 01:31	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/16/17 01:31	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

METHOD BLANK: 2794628

Matrix: Water

Associated Lab Samples: 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Chloroethane	ug/L	<0.44	1.0	0.44	12/16/17 01:31	
Chloroform	ug/L	<0.46	1.0	0.46	12/16/17 01:31	
Chloromethane	ug/L	<1.1	4.0	1.1	12/16/17 01:31	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/16/17 01:31	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/16/17 01:31	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/16/17 01:31	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/16/17 01:31	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/16/17 01:31	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/16/17 01:31	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/16/17 01:31	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Naphthalene	ug/L	<0.42	1.0	0.42	12/16/17 01:31	
o-Xylene	ug/L	<0.11	0.50	0.11	12/16/17 01:31	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Styrene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/16/17 01:31	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/16/17 01:31	
Toluene	ug/L	<0.17	0.50	0.17	12/16/17 01:31	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/16/17 01:31	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/16/17 01:31	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/16/17 01:31	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/16/17 01:31	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/16/17 01:31	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/16/17 01:31	
1,2-Dichloroethane-d4 (S)	%	96	75-137		12/16/17 01:31	
4-Bromofluorobenzene (S)	%	94	75-125		12/16/17 01:31	
Toluene-d8 (S)	%	99	75-125		12/16/17 01:31	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

LABORATORY CONTROL SAMPLE: 2794629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.5	107	75-136	
1,1,1-Trichloroethane	ug/L	20	18.1	90	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	17.3	87	71-138	
1,1,2-Trichloroethane	ug/L	20	18.9	95	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.9	89	69-126	
1,1-Dichloroethane	ug/L	20	19.1	95	75-125	
1,1-Dichloroethene	ug/L	20	17.9	90	75-125	
1,1-Dichloropropene	ug/L	20	15.7	79	75-125	
1,2,3-Trichlorobenzene	ug/L	20	18.0	90	75-125	
1,2,3-Trichloropropane	ug/L	20	20.4	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	17.6	88	75-125	
1,2,4-Trimethylbenzene	ug/L	20	18.4	92	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	46.9	94	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	19.1	96	75-125	
1,2-Dichlorobenzene	ug/L	20	18.8	94	75-125	
1,2-Dichloroethane	ug/L	20	19.5	98	70-125	
1,2-Dichloroethene (Total)	ug/L	40	36.8	92	75-125	
1,2-Dichloropropane	ug/L	20	17.8	89	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.1	90	75-125	
1,3-Dichlorobenzene	ug/L	20	19.7	99	75-125	
1,3-Dichloropropane	ug/L	20	19.6	98	75-125	
1,4-Dichlorobenzene	ug/L	20	19.5	97	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	391	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	14.1	70	68-125	
2,2-Dichloropropane	ug/L	20	16.5	83	70-131	
2-Butanone (MEK)	ug/L	100	73.0	73	69-125	
2-Chlorotoluene	ug/L	20	18.8	94	75-125	
2-Hexanone	ug/L	100	94.1	94	73-129	
4-Chlorotoluene	ug/L	20	17.4	87	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.2	99	73-125	
Acetone	ug/L	100	119	119	66-126	
Acrolein	ug/L	200	185	93	56-150	
Acrylonitrile	ug/L	200	184	92	68-129	
Benzene	ug/L	20	18.7	94	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	17.1	86	75-126	
Bromodichloromethane	ug/L	20	18.7	94	75-133	
Bromoform	ug/L	20	19.9	99	62-142	
Bromomethane	ug/L	20	15.5	77	34-143	
Carbon disulfide	ug/L	20	15.9	79	71-125	
Carbon tetrachloride	ug/L	20	19.1	96	71-145	
Chlorobenzene	ug/L	20	20.1	100	75-125	
Chloroethane	ug/L	20	19.1	95	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	16.1	80	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.1	91	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.4	92	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

LABORATORY CONTROL SAMPLE: 2794629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.1	105	74-141	
Dibromomethane	ug/L	20	20.7	104	75-125	
Dichlorodifluoromethane	ug/L	20	19.4	97	59-130	
Dichlorofluoromethane	ug/L	20	18.9	95	75-125	
Diisopropyl ether	ug/L	20	18.3	92	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.3	91	73-125	
Ethylbenzene	ug/L	20	19.8	99	75-125	
Hexachloro-1,3-butadiene	ug/L	20	18.5	93	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.1	95	75-125	
m&p-Xylene	ug/L	40	41.5	104	75-125	
Methyl-tert-butyl ether	ug/L	20	19.2	96	75-125	
Methylene Chloride	ug/L	20	16.5	82	73-125	
n-Butylbenzene	ug/L	20	17.4	87	75-125	
n-Propylbenzene	ug/L	20	17.3	86	75-125	
Naphthalene	ug/L	20	16.2	81	74-125	
o-Xylene	ug/L	20	19.3	96	75-125	
p-Isopropyltoluene	ug/L	20	18.5	93	75-125	
sec-Butylbenzene	ug/L	20	18.0	90	75-125	
Styrene	ug/L	20	19.7	99	75-125	
tert-Amylmethyl ether	ug/L	20	19.2	96	71-126	
tert-Butyl Alcohol	ug/L	200	244	122	69-131	
tert-Butylbenzene	ug/L	20	18.5	92	75-125	
Tetrachloroethene	ug/L	20	19.3	96	75-125	
Tetrahydrofuran	ug/L	200	187	94	65-127	
Toluene	ug/L	20	19.3	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.2	96	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	39.0	78	30-150	
Trichloroethene	ug/L	20	20.0	100	75-125	
Trichlorofluoromethane	ug/L	20	20.7	103	71-140	
Vinyl acetate	ug/L	20	17.2	86	68-137	
Vinyl chloride	ug/L	20	17.2	86	70-125	
Xylene (Total)	ug/L	60	60.7	101	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			93	75-125	
Toluene-d8 (S)	%			96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630 2794631

Parameter	Units	10414412001		MSD		MSD		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	20.7	19.9	104	100	75-137	4	30		
1,1,1-Trichloroethane	ug/L	<0.15	20	20	20.3	18.1	101	91	75-139	11	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	16.8	17.6	84	88	60-142	5	30		
1,1,2-Trichloroethane	ug/L	<0.22	20	20	18.3	17.7	91	88	75-128	3	30		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Parameter	Units	10414412001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630 2794631																
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	20.1	19.4	100	97	62-150	3	30					
1,1-Dichloroethane	ug/L	<0.14	20	20	18.8	19.4	94	97	70-129	3	30					
1,1-Dichloroethene	ug/L	<0.18	20	20	18.5	18.3	92	92	67-141	1	30					
1,1-Dichloropropene	ug/L	<0.18	20	20	17.5	15.7	87	78	64-144	11	30					
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	20.9	20.1	105	100	66-139	4	30					
1,2,3-Trichloropropane	ug/L	<0.66	20	20	20.2	20.5	101	103	69-134	2	30					
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	18.8	18.8	94	94	65-138	0	30					
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	18.5	18.3	92	92	65-143	1	30					
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	47.2	48.0	94	96	61-134	2	30					
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	17.7	17.3	88	87	74-129	2	30					
1,2-Dichlorobenzene	ug/L	<0.21	20	20	19.8	19.7	99	99	68-135	1	30					
1,2-Dichloroethane	ug/L	<0.15	20	20	18.9	18.3	94	92	73-125	3	30					
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	35.5	38.0	89	95	69-134	7	30					
1,2-Dichloropropane	ug/L	<0.62	20	20	16.4	17.2	82	86	64-130	5	30					
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	18.7	18.6	94	93	64-146	1	30					
1,3-Dichlorobenzene	ug/L	<0.16	20	20	20.1	20.0	100	100	69-135	0	30					
1,3-Dichloropropane	ug/L	<0.13	20	20	18.7	18.0	93	90	67-128	4	30					
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	19.6	98	98	66-134	0	30					
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	362	346	90	86	58-140	4	30					
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.8	16.3	84	81	48-150	3	30					
2,2-Dichloropropane	ug/L	<0.40	20	20	17.6	17.4	88	87	50-150	1	30					
2-Butanone (MEK)	ug/L	<2.4	100	100	80.6	65.4	81	65	58-125	21	30					
2-Chlorotoluene	ug/L	<0.20	20	20	19.0	18.8	95	94	65-138	1	30					
2-Hexanone	ug/L	<2.5	100	100	90.9	89.1	91	89	61-134	2	30					
4-Chlorotoluene	ug/L	<0.13	20	20	17.7	17.8	88	89	68-135	1	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	94.3	91.6	94	92	61-130	3	30					
Acetone	ug/L	<8.8	100	100	143	155	143	155	51-140	8	30	M1				
Acrolein	ug/L	<4.8	200	200	187	191	94	96	48-150	2	30					
Acrylonitrile	ug/L	<4.9	200	200	168	179	84	89	55-134	6	30					
Benzene	ug/L	<0.13	20	20	17.6	17.6	88	88	63-132	0	30					
Bromobenzene	ug/L	<0.16	20	20	20.3	20.4	102	102	67-138	0	30					
Bromochloromethane	ug/L	<0.38	20	20	18.3	16.8	91	84	66-138	8	30					
Bromodichloromethane	ug/L	<0.20	20	20	16.8	18.2	84	91	75-137	8	30					
Bromoform	ug/L	<1.0	20	20	18.2	19.2	91	96	65-129	5	30					
Bromomethane	ug/L	<1.5	20	20	17.7	18.3	88	91	41-150	3	30					
Carbon disulfide	ug/L	0.66J	20	20	17.1	17.1	82	82	72-132	0	30					
Carbon tetrachloride	ug/L	134	20	20	148	137	74	15	75-150	8	30	M1				
Chlorobenzene	ug/L	<0.14	20	20	19.6	18.8	98	94	73-127	4	30					
Chloroethane	ug/L	<0.44	20	20	19.9	20.6	99	103	74-138	3	30					
Chloroform	ug/L	9.4	20	20	25.6	23.8	81	72	74-125	7	30	M1				
Chloromethane	ug/L	<1.1	20	20	16.8	16.4	84	82	58-129	2	30					
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	16.3	18.5	81	93	63-135	13	30					
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	15.5	17.6	77	88	66-129	13	30					
Dibromochloromethane	ug/L	<0.13	20	20	20.5	20.0	102	100	75-133	2	30					

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Parameter	Units	2794630		2794631		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10414412001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.50	20	20	18.1	20.0	90	100	68-134	10	30	
Dichlorodifluoromethane	ug/L	<0.31	20	20	22.4	21.9	112	110	72-150	2	30	
Dichlorofluoromethane	ug/L	<0.38	20	20	19.6	20.1	98	101	75-129	2	30	
Diisopropyl ether	ug/L	<0.12	20	20	17.9	18.1	90	91	62-128	1	30	
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	16.7	17.9	83	90	63-132	7	30	
Ethylbenzene	ug/L	<0.14	20	20	19.6	19.1	98	96	72-130	2	30	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	21.2	20.0	106	100	71-150	6	30	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	19.0	18.2	95	91	70-136	4	30	
m&p-Xylene	ug/L	<0.24	40	40	41.8	39.7	104	99	64-142	5	30	
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.5	18.6	92	93	72-125	1	30	
Methylene Chloride	ug/L	<1.2	20	20	16.2	16.9	81	85	60-132	4	30	
n-Butylbenzene	ug/L	<0.13	20	20	18.3	17.6	92	88	60-150	4	30	
n-Propylbenzene	ug/L	<0.12	20	20	18.2	17.7	91	89	63-142	3	30	
Naphthalene	ug/L	<0.42	20	20	18.8	18.7	94	93	67-125	1	30	
o-Xylene	ug/L	<0.11	20	20	18.8	18.3	94	92	60-143	3	30	
p-Isopropyltoluene	ug/L	<0.14	20	20	18.8	18.5	94	92	64-146	2	30	
sec-Butylbenzene	ug/L	<0.12	20	20	19.0	18.4	95	92	67-144	3	30	
Styrene	ug/L	<0.14	20	20	18.0	17.4	90	87	67-136	3	30	
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.6	17.9	93	89	60-134	4	30	
tert-Butyl Alcohol	ug/L	<2.2	200	200	222	206	111	103	56-146	7	30	
tert-Butylbenzene	ug/L	<0.15	20	20	19.0	18.2	95	91	68-135	4	30	
Tetrachloroethene	ug/L	<0.16	20	20	19.2	18.5	96	92	67-148	4	30	
Tetrahydrofuran	ug/L	<4.3	200	200	270	233	135	116	51-141	15	30	
Toluene	ug/L	<0.17	20	20	18.9	18.3	94	92	61-140	3	30	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.3	19.5	96	97	62-138	1	30	
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	18.4	17.7	92	88	67-134	4	30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	37.0	38.0	74	76	30-150	3	30	
Trichloroethene	ug/L	<0.18	20	20	19.9	20.6	100	103	64-149	3	30	
Trichlorofluoromethane	ug/L	<0.13	20	20	22.7	22.9	114	114	75-150	1	30	
Vinyl acetate	ug/L	<1.5	20	20	14.5	15.7	73	79	49-143	8	30	
Vinyl chloride	ug/L	<0.096	20	20	18.9	19.2	95	96	75-133	1	30	
Xylene (Total)	ug/L	<0.24	60	60	60.5	58.0	101	97	63-142	4	30	
1,2-Dichloroethane-d4 (S)	%						96	97	75-137			
4-Bromofluorobenzene (S)	%						94	94	75-125			
Toluene-d8 (S)	%						96	95	75-125			

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 514230

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10414407003

METHOD BLANK: 2796443

Matrix: Water

Associated Lab Samples: 10414407003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/19/17 00:13	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/19/17 00:13	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/19/17 00:13	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/19/17 00:13	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/19/17 00:13	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/19/17 00:13	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/19/17 00:13	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/19/17 00:13	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/19/17 00:13	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/19/17 00:13	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/19/17 00:13	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/19/17 00:13	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/19/17 00:13	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/19/17 00:13	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/19/17 00:13	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/19/17 00:13	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/19/17 00:13	
Acetone	ug/L	<8.8	20.0	8.8	12/19/17 00:13	
Acrolein	ug/L	<4.8	10.0	4.8	12/19/17 00:13	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/19/17 00:13	
Benzene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/19/17 00:13	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
Bromoform	ug/L	<1.0	4.0	1.0	12/19/17 00:13	
Bromomethane	ug/L	<1.5	4.0	1.5	12/19/17 00:13	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/19/17 00:13	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/19/17 00:13	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

METHOD BLANK: 2796443

Matrix: Water

Associated Lab Samples: 10414407003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Chloroethane	ug/L	<0.44	1.0	0.44	12/19/17 00:13	
Chloroform	ug/L	<0.46	1.0	0.46	12/19/17 00:13	
Chloromethane	ug/L	<1.1	4.0	1.1	12/19/17 00:13	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/19/17 00:13	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/19/17 00:13	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/19/17 00:13	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/19/17 00:13	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/19/17 00:13	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/19/17 00:13	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/19/17 00:13	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Naphthalene	ug/L	<0.42	1.0	0.42	12/19/17 00:13	
o-Xylene	ug/L	<0.11	0.50	0.11	12/19/17 00:13	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Styrene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/19/17 00:13	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/19/17 00:13	
Toluene	ug/L	<0.17	0.50	0.17	12/19/17 00:13	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/19/17 00:13	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/19/17 00:13	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/19/17 00:13	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/19/17 00:13	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/19/17 00:13	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/19/17 00:13	
1,2-Dichloroethane-d4 (S)	%	96	75-137		12/19/17 00:13	
4-Bromofluorobenzene (S)	%	94	75-125		12/19/17 00:13	
Toluene-d8 (S)	%	95	75-125		12/19/17 00:13	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

LABORATORY CONTROL SAMPLE & LCSD: 2796444

2796445

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.1	21.8	111	109	75-136	2	30	
1,1,1-Trichloroethane	ug/L	20	23.5	21.1	117	106	75-129	11	30	
1,1,2,2-Tetrachloroethane	ug/L	20	16.6	17.4	83	87	71-138	5	30	
1,1,2-Trichloroethane	ug/L	20	19.2	18.9	96	95	75-125	1	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.1	18.7	101	94	69-126	7	30	
1,1-Dichloroethane	ug/L	20	18.3	17.9	91	89	75-125	2	30	
1,1-Dichloroethene	ug/L	20	19.9	18.7	99	94	75-125	6	30	
1,1-Dichloropropene	ug/L	20	20.8	18.3	104	92	75-125	13	30	
1,2,3-Trichlorobenzene	ug/L	20	18.3	21.6	91	108	75-125	17	30	
1,2,3-Trichloropropane	ug/L	20	20.6	20.9	103	104	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	18.7	19.8	94	99	75-125	6	30	
1,2,4-Trimethylbenzene	ug/L	20	19.3	19.3	96	97	75-125	0	30	
1,2-Dibromo-3-chloropropane	ug/L	50	49.0	52.8	98	106	71-130	7	30	
1,2-Dibromoethane (EDB)	ug/L	20	19.0	19.4	95	97	75-125	2	30	
1,2-Dichlorobenzene	ug/L	20	20.3	20.9	101	105	75-125	3	30	
1,2-Dichloroethane	ug/L	20	17.7	20.1	88	101	70-125	13	30	
1,2-Dichloroethene (Total)	ug/L	40	39.1	34.7	98	87	75-125	12	30	
1,2-Dichloropropane	ug/L	20	17.0	17.9	85	90	75-125	6	30	
1,3,5-Trimethylbenzene	ug/L	20	19.4	19.9	97	100	75-125	2	30	
1,3-Dichlorobenzene	ug/L	20	20.8	21.2	104	106	75-125	2	30	
1,3-Dichloropropane	ug/L	20	19.3	18.8	97	94	75-125	2	30	
1,4-Dichlorobenzene	ug/L	20	20.9	21.4	105	107	75-125	2	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	394	403	98	101	64-140	2	30	
2,2,4-Trimethylpentane	ug/L	20	17.5	13.7	88	69	68-125	24	30	
2,2-Dichloropropane	ug/L	20	21.1	18.6	105	93	70-131	12	30	
2-Butanone (MEK)	ug/L	100	100	81.2	100	81	69-125	21	30	
2-Chlorotoluene	ug/L	20	19.7	20.2	98	101	75-125	3	30	
2-Hexanone	ug/L	100	94.2	94.1	94	94	73-129	0	30	
4-Chlorotoluene	ug/L	20	18.3	19.1	92	95	75-125	4	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.9	95.3	99	95	73-125	4	30	
Acetone	ug/L	100	106	104	106	104	66-126	2	30	
Acrolein	ug/L	200	168	183	84	92	56-150	9	30	
Acrylonitrile	ug/L	200	135	178	68	89	68-129	27	30	
Benzene	ug/L	20	19.0	18.0	95	90	75-125	5	30	
Bromobenzene	ug/L	20	20.7	21.7	103	108	75-125	5	30	
Bromochloromethane	ug/L	20	20.5	20.5	103	102	75-126	0	30	
Bromodichloromethane	ug/L	20	20.1	19.1	101	96	75-133	5	30	
Bromoform	ug/L	20	20.6	20.7	103	103	62-142	1	30	
Bromomethane	ug/L	20	22.1	24.1	111	120	34-143	8	30	
Carbon disulfide	ug/L	20	19.3	17.5	96	88	71-125	9	30	
Carbon tetrachloride	ug/L	20	23.8	22.1	119	111	71-145	7	30	
Chlorobenzene	ug/L	20	21.1	20.7	106	104	75-125	2	30	
Chloroethane	ug/L	20	20.1	19.5	100	97	75-125	3	30	
Chloroform	ug/L	20	20.6	18.8	103	94	75-125	9	30	
Chloromethane	ug/L	20	19.0	17.8	95	89	54-125	6	30	
cis-1,2-Dichloroethene	ug/L	20	19.4	16.9	97	84	75-125	14	30	
cis-1,3-Dichloropropene	ug/L	20	19.6	19.0	98	95	75-125	3	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

LABORATORY CONTROL SAMPLE & LCSD: 2796444		2796445								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	22.0	22.0	110	110	74-141	0	30	
Dibromomethane	ug/L	20	22.2	21.2	111	106	75-125	5	30	
Dichlorodifluoromethane	ug/L	20	21.0	20.1	105	100	59-130	5	30	
Dichlorofluoromethane	ug/L	20	20.7	19.4	104	97	75-125	6	30	
Diisopropyl ether	ug/L	20	17.1	17.2	86	86	69-125	0	30	
Ethyl-tert-butyl ether	ug/L	20	15.1	17.9	76	90	73-125	17	30	
Ethylbenzene	ug/L	20	20.9	20.7	105	103	75-125	1	30	
Hexachloro-1,3-butadiene	ug/L	20	20.2	21.4	101	107	75-131	6	30	
Isopropylbenzene (Cumene)	ug/L	20	20.3	19.8	102	99	75-125	3	30	
m&p-Xylene	ug/L	40	43.5	42.8	109	107	75-125	2	30	
Methyl-tert-butyl ether	ug/L	20	19.6	19.3	98	97	75-125	1	30	
Methylene Chloride	ug/L	20	15.1	16.5	75	83	73-125	9	30	
n-Butylbenzene	ug/L	20	18.5	18.7	93	93	75-125	1	30	
n-Propylbenzene	ug/L	20	18.5	18.7	92	94	75-125	1	30	
Naphthalene	ug/L	20	16.8	19.5	84	97	74-125	14	30	
o-Xylene	ug/L	20	20.1	20.4	101	102	75-125	1	30	
p-Isopropyltoluene	ug/L	20	19.7	19.2	98	96	75-125	2	30	
sec-Butylbenzene	ug/L	20	19.2	19.7	96	99	75-125	3	30	
Styrene	ug/L	20	20.0	20.0	100	100	75-125	0	30	
tert-Amylmethyl ether	ug/L	20	19.3	18.9	97	94	71-126	2	30	
tert-Butyl Alcohol	ug/L	200	227	214	113	107	69-131	6	30	
tert-Butylbenzene	ug/L	20	19.2	20.1	96	101	75-125	4	30	
Tetrachloroethene	ug/L	20	20.7	20.3	103	101	75-125	2	30	
Tetrahydrofuran	ug/L	200	249	204	125	102	65-127	20	30	
Toluene	ug/L	20	18.0	19.9	90	100	75-125	10	30	
trans-1,2-Dichloroethene	ug/L	20	19.6	17.8	98	89	75-125	10	30	
trans-1,3-Dichloropropene	ug/L	20	19.9	19.6	100	98	75-125	2	30	
trans-1,4-Dichloro-2-butene	ug/L	50	45.3	46.2	91	92	30-150	2	30	
Trichloroethene	ug/L	20	22.2	21.4	111	107	75-125	4	30	
Trichlorofluoromethane	ug/L	20	22.8	21.1	114	105	71-140	8	30	
Vinyl acetate	ug/L	20	12.7	16.0	64	80	68-137	22	30 L2	
Vinyl chloride	ug/L	20	18.7	17.5	93	88	70-125	6	30	
Xylene (Total)	ug/L	60	63.6	63.2	106	105	75-125	1	30	
1,2-Dichloroethane-d4 (S)	%				99	96	75-137			
4-Bromofluorobenzene (S)	%				90	94	75-125			
Toluene-d8 (S)	%				86	97	75-125			

MATRIX SPIKE SAMPLE: 2796446		10414592001						
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	21.6	108	75-137		
1,1,1-Trichloroethane	ug/L	<0.15	20	22.5	113	75-139		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	16.8	84	60-142		
1,1,2-Trichloroethane	ug/L	<0.22	20	18.8	94	75-128		
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	21.0	105	62-150		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

MATRIX SPIKE SAMPLE: 2796446		10414592001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	16.5	82	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	20.4	102	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	20.0	100	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20.6	103	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	20.4	102	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	19.6	98	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	18.5	92	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	48.6	97	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	18.9	95	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	19.9	100	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	20.7	104	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	38.2	95	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	20.4	102	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	19.0	95	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	20.2	101	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	19.0	95	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	20.1	100	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	366	92	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	19.3	97	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	20.3	102	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	94.1	94	58-125	
2-Chlorotoluene	ug/L	<0.20	20	19.5	97	65-138	
2-Hexanone	ug/L	<2.5	100	94.1	94	61-134	
4-Chlorotoluene	ug/L	<0.13	20	18.1	90	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	96.7	97	61-130	
Acetone	ug/L	<8.8	100	165	165	51-140	M1
Acrolein	ug/L	<4.8	200	189	95	48-150	
Acrylonitrile	ug/L	<4.9	200	150	75	55-134	
Benzene	ug/L	<0.13	20	20.2	101	63-132	
Bromobenzene	ug/L	<0.16	20	20.4	102	67-138	
Bromochloromethane	ug/L	<0.38	20	20.5	102	66-138	
Bromodichloromethane	ug/L	<0.20	20	21.0	105	75-137	
Bromoform	ug/L	<1.0	20	20.2	101	65-129	
Bromomethane	ug/L	<1.5	20	25.5	127	41-150	
Carbon disulfide	ug/L	<0.37	20	19.0	95	72-132	
Carbon tetrachloride	ug/L	<0.20	20	23.4	117	75-150	
Chlorobenzene	ug/L	<0.14	20	20.5	103	73-127	
Chloroethane	ug/L	<0.44	20	20.6	103	74-138	
Chloroform	ug/L	<0.46	20	19.9	100	74-125	
Chloromethane	ug/L	<1.1	20	19.0	95	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	17.5	87	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	19.3	97	66-129	
Dibromochloromethane	ug/L	<0.13	20	21.5	108	75-133	
Dibromomethane	ug/L	<0.50	20	23.2	116	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	23.5	117	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.9	104	75-129	
Diisopropyl ether	ug/L	<0.12	20	14.5	73	62-128	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

MATRIX SPIKE SAMPLE: 2796446

Parameter	Units	10414592001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	16.5	83	63-132	
Ethylbenzene	ug/L	<0.14	20	20.4	102	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	19.9	99	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	19.9	100	70-136	
m&p-Xylene	ug/L	<0.24	40	42.6	107	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	17.1	86	72-125	
Methylene Chloride	ug/L	<1.2	20	15.8	79	60-132	
n-Butylbenzene	ug/L	<0.13	20	17.8	89	60-150	
n-Propylbenzene	ug/L	<0.12	20	18.2	91	63-142	
Naphthalene	ug/L	<0.42	20	18.6	93	67-125	
o-Xylene	ug/L	<0.11	20	19.9	100	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	19.0	95	64-146	
sec-Butylbenzene	ug/L	<0.12	20	18.6	93	67-144	
Styrene	ug/L	<0.14	20	19.4	97	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	19.5	98	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	181	90	56-146	
tert-Butylbenzene	ug/L	<0.15	20	19.1	95	68-135	
Tetrachloroethene	ug/L	<0.16	20	20.2	101	67-148	
Tetrahydrofuran	ug/L	<4.3	200	358	179	51-141 M1	
Toluene	ug/L	<0.17	20	19.7	99	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20.7	104	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	18.6	93	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	43.9	88	30-150	
Trichloroethene	ug/L	<0.18	20	21.5	108	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	24.4	122	75-150	
Vinyl acetate	ug/L	<1.5	20	14.6	73	49-143	
Vinyl chloride	ug/L	<0.096	20	19.5	97	75-133	
Xylene (Total)	ug/L	<0.24	60	62.5	104	63-142	
1,2-Dichloroethane-d4 (S)	%					95	75-137
4-Bromofluorobenzene (S)	%					92	75-125
Toluene-d8 (S)	%					93	75-125

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	99	100	1		
4-Bromofluorobenzene (S)	%	93	94	0		
Toluene-d8 (S)	%	97	96	0		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 514065 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10414407001, 10414407002, 10414407004

METHOD BLANK: 2795854 Matrix: Water

Associated Lab Samples: 10414407001, 10414407002, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	12/16/17 14:21	

LABORATORY CONTROL SAMPLE & LCSD: 2795855 2795856

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	40.9	40.8	102	102	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795857 2795858

Parameter	Units	10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	176	40	40	219	219	107	107	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795859 2795860

Parameter	Units	10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	155	40	40	197	202	104	116	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 514330

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10414407001, 10414407004

METHOD BLANK: 2796777

Matrix: Water

Associated Lab Samples: 10414407001, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/18/17 16:02	

LABORATORY CONTROL SAMPLE: 2796778

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	970	97	80-120	

SAMPLE DUPLICATE: 2796779

Parameter	Units	10414076001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1810	1770	3	10	

SAMPLE DUPLICATE: 2796780

Parameter	Units	10414407001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	257	250	3	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 514455

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10414407002

METHOD BLANK: 2797612

Matrix: Water

Associated Lab Samples: 10414407002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/19/17 16:02	

LABORATORY CONTROL SAMPLE: 2797613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	996	100	80-120	

SAMPLE DUPLICATE: 2797614

Parameter	Units	10414407002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	257	271	5	10	

SAMPLE DUPLICATE: 2797615

Parameter	Units	10414554006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	920	840	9	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 97062

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

METHOD BLANK: 417757

Matrix: Water

Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/18/17 10:06	

LABORATORY CONTROL SAMPLE: 417758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	93	90-110	

MATRIX SPIKE SAMPLE: 417760

Parameter	Units	2066893001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.060	30	75-125	M1

SAMPLE DUPLICATE: 417759

Parameter	Units	2066893001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414407

QC Batch: 513604 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10414407001, 10414407002, 10414407004

METHOD BLANK: 2792864 Matrix: Water  
Associated Lab Samples: 10414407001, 10414407002, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.27J	1.2	0.14	12/14/17 10:29	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/14/17 10:29	
Sulfate	mg/L	<0.27	1.2	0.27	12/14/17 10:29	

LABORATORY CONTROL SAMPLE: 2792865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.1	97	90-110	
Nitrate as N	mg/L	1	0.94	94	90-110	
Sulfate	mg/L	12.5	11.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2792866 2792867

Parameter	Units	10414278001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MS Result	MSD Result	% Rec	% Rec				
Chloride	mg/L	69.9	12.5	12.5	61.6	61.9	-66	-64	90-110	0	20	M1	
Nitrate as N	mg/L	3.0	1	1	3.1	3.1	10	11	90-110	0	20	M1	
Sulfate	mg/L	38.9	12.5	12.5	39.2	39.3	2	3	90-110	0	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2793351 2793352

Parameter	Units	10414407001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MS Result	MSD Result	% Rec	% Rec				
Chloride	mg/L	5.5	12.5	12.5	16.4	16.9	87	91	90-110	3	20	M1	
Nitrate as N	mg/L	2.5	1	1	3.0	3.0	46	52	90-110	2	20	M1	
Sulfate	mg/L	9.9	12.5	12.5	20.2	20.8	83	87	90-110	3	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2793353 2793354

Parameter	Units	10414407002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MS Result	MSD Result	% Rec	% Rec				
Chloride	mg/L	15.1	12.5	12.5	23.8	22.4	70	58	90-110	6	20	M1	
Nitrate as N	mg/L	4.0	1	1	4.1	3.9	10	-11	90-110	5	20	M1	
Sulfate	mg/L	13.4	12.5	12.5	22.9	21.4	75	64	90-110	7	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 513873

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10414407001, 10414407003, 10414407004

METHOD BLANK: 2794479

Matrix: Water

Associated Lab Samples: 10414407001, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/15/17 12:34	

LABORATORY CONTROL SAMPLE: 2794480

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.99	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794481 2794482

Parameter	Units	2794481		2794482		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	2.6	2	2	4.4	4.5	91	94	90-110	1	20 E

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414407

QC Batch: 515347 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10414407002

METHOD BLANK: 2802262 Matrix: Water  
Associated Lab Samples: 10414407002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 13:41	

LABORATORY CONTROL SAMPLE: 2802263

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802264 2802265

Parameter	Units	10414407002		2802264		2802265		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	4.2	5	5	5	9.3	9.0	101	95	90-110	3	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802266 2802267

Parameter	Units	10414496003		2802266		2802267		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	1	1.1	1.0	97	93	90-110	4	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 513838 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

METHOD BLANK: 2794369 Matrix: Water  
 Associated Lab Samples: 10414407001, 10414407002, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	12/15/17 13:13	

LABORATORY CONTROL SAMPLE: 2794370

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	296	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794371 2794372

Parameter	Units	10414407001		2794371		2794372		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chemical Oxygen Demand	mg/L	<15.8	250	250	278	256	105	97	90-110	8	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794373 2794374

Parameter	Units	10414407002		2794373		2794374		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chemical Oxygen Demand	mg/L	<15.8	250	250	255	253	102	101	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414407

QC Batch: 133717 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10414407001

METHOD BLANK: 532868 Matrix: Water  
Associated Lab Samples: 10414407001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	12/18/17 20:33	

LABORATORY CONTROL SAMPLE: 532869

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.4	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 532870 532871

Parameter	Units	10414343003		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	1.7	25	25	27.3	26.8	103	101	80-120	2	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 532872 532873

Parameter	Units	10414407001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	0.26J	25	25	26.2	25.9	104	103	80-120	1	20				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

QC Batch: 133734

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10414407002, 10414407003, 10414407004

METHOD BLANK: 532952

Matrix: Water

Associated Lab Samples: 10414407002, 10414407003, 10414407004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	12/18/17 15:54	

LABORATORY CONTROL SAMPLE: 532953

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.3	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 532954 532955

Parameter	Units	532954		532955		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.56J	25	25	25.7	25.9	101	101	80-120	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### BATCH QUALIFIERS

Batch: 514230

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

---

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414407

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414407001	Randall-GW-121217	RSK 175	513866		
10414407002	Marlow-GW-121217	RSK 175	514040		
10414407003	FD1-GW-121217	RSK 175	513866		
10414407004	FD2-GW-121217	RSK 175	513866		
10414407001	Randall-GW-121217	EPA 3010	514108	6010C Met	515071
10414407002	Marlow-GW-121217	EPA 3010	514108	6010C Met	515071
10414407003	FD1-GW-121217	EPA 3010	514108	6010C Met	515071
10414407004	FD2-GW-121217	EPA 3010	514108	6010C Met	515071
10414407001	Randall-GW-121217	EPA 7470A	514122	EPA 7470A	515039
10414407002	Marlow-GW-121217	EPA 7470A	514122	EPA 7470A	515039
10414407003	FD1-GW-121217	EPA 7470A	514122	EPA 7470A	515039
10414407004	FD2-GW-121217	EPA 7470A	514122	EPA 7470A	515039
10414407003	FD1-GW-121217	EPA 8260B	514230		
10414407004	FD2-GW-121217	EPA 8260B	513906		
10414407001	Randall-GW-121217	SM 2320B	514065		
10414407002	Marlow-GW-121217	SM 2320B	514065		
10414407004	FD2-GW-121217	SM 2320B	514065		
10414407001	Randall-GW-121217	SM 2540C	514330		
10414407002	Marlow-GW-121217	SM 2540C	514455		
10414407004	FD2-GW-121217	SM 2540C	514330		
10414407001	Randall-GW-121217	SM 4500-S-2 D	97062		
10414407002	Marlow-GW-121217	SM 4500-S-2 D	97062		
10414407003	FD1-GW-121217	SM 4500-S-2 D	97062		
10414407004	FD2-GW-121217	SM 4500-S-2 D	97062		
10414407001	Randall-GW-121217	EPA 300.0	513604		
10414407002	Marlow-GW-121217	EPA 300.0	513604		
10414407004	FD2-GW-121217	EPA 300.0	513604		
10414407001	Randall-GW-121217	EPA 353.2	513873		
10414407002	Marlow-GW-121217	EPA 353.2	515347		
10414407003	FD1-GW-121217	EPA 353.2	513873		
10414407004	FD2-GW-121217	EPA 353.2	513873		
10414407001	Randall-GW-121217	EPA 410.4	513838	EPA 410.4	513948
10414407002	Marlow-GW-121217	EPA 410.4	513838	EPA 410.4	513948
10414407003	FD1-GW-121217	EPA 410.4	513838	EPA 410.4	513948
10414407004	FD2-GW-121217	EPA 410.4	513838	EPA 410.4	513948
10414407001	Randall-GW-121217	SM 5310C	133717		
10414407002	Marlow-GW-121217	SM 5310C	133734		
10414407003	FD1-GW-121217	SM 5310C	133734		
10414407004	FD2-GW-121217	SM 5310C	133734		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

### Section A

#### Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email:  
 Phone: Fax:  
 Requested Due Date: **10 Day Standard**

### Section B

#### Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # PEDD# 1497  
 Project Name: UPRR Freeman  
 Project #: 1497

### Section C

#### Invoice Information:

Attention: Anne Theriault  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447 / 4

Page: 1 of 1

10414407

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Requested Analysis/Filtered (Y/N)												Regulatory Agency	State / Location	WA / Freeman		
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Analyses Test	Y	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0'	2540 TDS /	TOC 5310'	Sulfide 4600'	Methane, Ethane, Ethene RSK175'	COD 410.4'	BOD 10360WLL				Nitrate-Nitrite 353.2'	CSIA of CTET (8260 Analysis Required)
						DATE	TIME	DATE	TIME																										
1	Randall-GW-121217	WTG					12/13/17	1640	24	S																									MS/MSD 001
2	Marlow-GW-121217	WTG					12/13/17	1400	24	S																									MS/MSD 002
3	FD1-GW-121217	WTG					12/13/17		18		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Field Dup 003
4	FD2-GW-121217	WTG					12/13/17		11		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Field Dup 004	
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			


ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Short hold analyses are in bold	JKB/CH2M	12-13-17	1200	Eric Pace	12/14/17	1000	1.1	3.3	Y	Y	Y
*Field filtered by client							2.1				

Page 64 of 70

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	L. K. Baumann				
SIGNATURE of SAMPLER:	JKB	DATE Signed:	12-13-17		

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** OPRR - CH2M Hill  
**Project #:** 0160

**WO# : 10414407**  
  
 10414407

**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other: \_\_\_\_\_

**Tracking Number:** 2475 9392 9211 / 7475 9636 3971 / 7448 1033

**Custody Seal on Cooler/Box Present?**  Yes  No  
**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_  
**Thermometer**  151401163  G87A9155100842  
**Used:** \_\_\_\_\_  
**Temp Blank?**  Yes  No  
**Seals Intact?**  Yes  No  
**Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
**Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun  
**Cooler Temp Read (°C):** 1.0, 3.2, 2.0 **Cooler Temp Corrected (°C):** 1.1, 3.3, 2.1 **Biological Tissue Frozen?**  Yes  No  N/A  
**Temp should be above freezing to 6°C** **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** ME 12/14/17  
**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <u>ME 12/14/17</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2</u> <u>3/3</u> <u>3/3</u> <u>3/3</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: <u>VOA</u> , <u>Coliform</u> , <u>TOC/DOC</u> , Oil and Grease, DRO/8015 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>3-4</u> <u>1/1</u> <u>1/1</u> <u>1/1</u>
Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <u>ME 12/14/17</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>1 Shared Trip Blank</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>140928</u>	

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?**  Yes  No  
 Person Contacted: Lindsey / Steve Date/Time: 12/14/17

Comments/Resolution: Notified client of missing lid for the unpreserved containers.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1225</u> Temp: <u>1.0, 3.2</u> Corrected <u>1.1, 3.3</u>	
Time: <u>1240</u> put in cooler Temp: <u>2.0</u> Corrected Temp: <u>2.1</u>	
Time: _____ Temp: _____ Corrected Temp: _____	

**Project Manager Review:** JENNI GROSS Date: 12/14/17  
 Note: Whenever there is a discrepancy affecting North Carolina comp. hold, incorrect preservative, out of temp, incorrect containers) his form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of



Document Name:  
Sample Condition Upon Receipt Form

Document No.:  
F-MN-L-213-rev.21

Document Revised: 30Aug2017  
Page 2 of 2

Issuing Authority:  
Pace Minnesota Quality Office

**SCUR Exceptions:**

**Workorder #:**

Issue	Sample ID	Container Type/#
Container Arrived w/o lid	Randall-GW-121217	1/3 BP2U
"	FDI-GW-121217	1/1 BP2U

**pH Adjustment Log for Preserved Samples**

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials



# Chain of Custody

**WO#: 12102572**  
 PM: HRZ Due Date: 12/29/17  
 CLIENT: P ICE MPLS

Workorder: 10414407

Workorder Name: 1497 UPRR\_Freeman

Owner Received Date: 12/14/2017

Results Requested By: 12/29/2017

Report To			Subcontract To			Requested Analysis											
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426			Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042														

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers								5632354 / 5310 TOC	LAB USE ONLY		
						H2SO4											
1	Randall-GW-121217	RQS	12/12/2017 10:40	10414407001	Water	3											
2	Marlow-GW-121217	RQS	12/12/2017 14:00	10414407002	Water	3											
3	FD1-GW-121217	PS	12/12/2017 12:00	10414407003	Water	1											
4	FD2-GW-121217	PS	12/12/2017 12:00	10414407004	Water	1											
5																	

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i> Pace	12/14/17 1530	<i>[Signature]</i> Chris	12/14 19:00	
2	<i>[Signature]</i> Chris	12/15 0:30	<i>[Signature]</i> B Mathews	12/15/17 0900	
3					

Cooler Temperature on Receipt °C	Custody Seal Y or N	Received on Ice Y or N	Samples Intact Y or N
----------------------------------	---------------------	------------------------	-----------------------

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MW

**WO# : 12102572**  
 PM: HRZ Due Date: 12/29/17  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Other: \_\_\_\_\_  
 Commercial  Pace

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.0 Cooler Temp Corrected °C: 1.3 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 1.3 Date and Initials of Person Examining Contents: 12/15 DC

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 12/15/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody \_\_\_\_\_

WO#: 2067095



alytical<sup>®</sup>  
w.pacelabs.com

Workorder: 10414407      Workorder Name: 1497 UPRR\_Freeman      Owner Received Date: 12/14/2017      Results Requested By: 12/29/2017

Report To		Subcontract To						Requested Analysis																														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333						5636267 / 4500 Sulfide																														
		LAB USE ONLY																																				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers																	Other	X	X	X	X	X	X	X	X	X	X	X	X			
1	Randall-GW-121217	RQS	12/12/2017 10:40	10414407001	Water	3																					X											
2	Marlow-GW-121217	RQS	12/12/2017 14:00	10414407002	Water	3						X																										
3	FD1-GW-121217	PS	12/12/2017 12:00	10414407003	Water	1						X																										
4	FD2-GW-121217	PS	12/12/2017 12:00	10414407004	Water	1						X																										
5																																						
Transfers	Released By	Date/Time		Received By	Date/Time	Comments																																
1	<i>[Signature]</i>	12/14/17 10:35		<i>[Signature]</i>	12-15-17 10:05	PAC 12-15-17 10:05																																
2	<i>[Signature]</i>	12-15-17 10:05		<i>[Signature]</i>																																		
3																																						
Cooler Temperature on Receipt		.5 °C		Custody Seal Y or N			Received on Ice Y or N			Samples Intact Y or N																												

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon I

Pro

# WO#: 2067095

PM: CMM

Due Date: 12/29/17

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:	<input type="checkbox"/> Therm Fisher IR 5
	<input type="checkbox"/> Therm Fisher IR 6
	<input checked="" type="checkbox"/> Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12-15-17

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No	15

If No, was preservative added?  Yes  No  
If added record lot no.: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

December 20, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

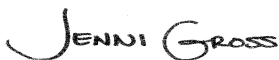
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414412

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414412001	Marlow-GW-121217	Water	12/12/17 14:00	12/14/17 10:00
10414412002	Trip Blank-121217	Water	12/12/17 07:00	12/14/17 10:00

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**SAMPLE ANALYTE COUNT**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414412

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414412001	Marlow-GW-121217	EPA 8260B	DJB	83	PASI-M
10414412002	Trip Blank-121217	EPA 8260B	DJB	83	PASI-M

**REPORT OF LABORATORY ANALYSIS**

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414412001</b>	<b>Marlow-GW-121217</b>					
EPA 8260B	Carbon disulfide	0.66J	ug/L	1.0	12/16/17 03:05	
EPA 8260B	Carbon tetrachloride	134	ug/L	0.50	12/16/17 03:05	M1
EPA 8260B	Chloroform	9.4	ug/L	1.0	12/16/17 03:05	M1

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 20, 2017

**General Information:**

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 513905

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414415001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2794626)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2794627)
  - Acetone
  - Carbon tetrachloride
  - Tetrahydrofuran

QC Batch: 513906

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414412001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2794630)
  - Acetone

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 20, 2017

QC Batch: 513906

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414412001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Carbon tetrachloride
- MSD (Lab ID: 2794631)
- Acetone
- Carbon tetrachloride
- Chloroform

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

Sample: Marlow-GW-121217 Lab ID: 10414412001 Collected: 12/12/17 14:00 Received: 12/14/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 03:05	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/16/17 03:05	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/16/17 03:05	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/16/17 03:05	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:05	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:05	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/16/17 03:05	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:05	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/16/17 03:05	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/16/17 03:05	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/16/17 03:05	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/16/17 03:05	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/16/17 03:05	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/16/17 03:05	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/16/17 03:05	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/16/17 03:05	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:05	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/16/17 03:05	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/16/17 03:05	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/16/17 03:05	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/16/17 03:05	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/16/17 03:05	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/16/17 03:05	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/16/17 03:05	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/16/17 03:05	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/16/17 03:05	67-64-1	M1
Acrolein	<4.8	ug/L	10.0	4.8	1		12/16/17 03:05	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/16/17 03:05	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:05	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 03:05	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/16/17 03:05	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/16/17 03:05	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/16/17 03:05	74-83-9	
Carbon disulfide	0.66J	ug/L	1.0	0.37	1		12/16/17 03:05	75-15-0	
Carbon tetrachloride	134	ug/L	0.50	0.20	1		12/16/17 03:05	56-23-5	M1
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/16/17 03:05	75-00-3	
Chloroform	9.4	ug/L	1.0	0.46	1		12/16/17 03:05	67-66-3	M1
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/16/17 03:05	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

**Sample: Marlow-GW-121217**      **Lab ID: 10414412001**      Collected: 12/12/17 14:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/16/17 03:05	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/16/17 03:05	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/16/17 03:05	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/16/17 03:05	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/16/17 03:05	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/16/17 03:05	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/16/17 03:05	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/16/17 03:05	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/16/17 03:05	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/16/17 03:05	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/16/17 03:05	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/16/17 03:05	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/16/17 03:05	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/16/17 03:05	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/16/17 03:05	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:05	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/16/17 03:05	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/16/17 03:05	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:05	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/16/17 03:05	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/16/17 03:05	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/16/17 03:05	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/16/17 03:05	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/16/17 03:05	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/16/17 03:05	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/16/17 03:05	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/16/17 03:05	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	93	%	75-137		1		12/16/17 03:05	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		12/16/17 03:05	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		12/16/17 03:05	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

**Sample: Trip Blank-121217**      **Lab ID: 10414412002**      Collected: 12/12/17 07:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/15/17 15:21	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/15/17 15:21	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/15/17 15:21	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/15/17 15:21	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/15/17 15:21	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/15/17 15:21	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/15/17 15:21	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/15/17 15:21	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/15/17 15:21	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/15/17 15:21	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/15/17 15:21	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/15/17 15:21	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/15/17 15:21	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/15/17 15:21	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/15/17 15:21	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/15/17 15:21	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/15/17 15:21	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/15/17 15:21	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/15/17 15:21	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/15/17 15:21	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/15/17 15:21	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/15/17 15:21	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/15/17 15:21	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/15/17 15:21	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/15/17 15:21	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/15/17 15:21	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/15/17 15:21	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/15/17 15:21	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/15/17 15:21	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/15/17 15:21	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/15/17 15:21	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

**Sample:** Trip Blank-121217      **Lab ID:** 10414412002      Collected: 12/12/17 07:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/15/17 15:21	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/15/17 15:21	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/15/17 15:21	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/15/17 15:21	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/15/17 15:21	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/15/17 15:21	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/15/17 15:21	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/15/17 15:21	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/15/17 15:21	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/15/17 15:21	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/15/17 15:21	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/15/17 15:21	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/15/17 15:21	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/15/17 15:21	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/15/17 15:21	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/15/17 15:21	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/15/17 15:21	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/15/17 15:21	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/15/17 15:21	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/15/17 15:21	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		12/15/17 15:21	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		12/15/17 15:21	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/15/17 15:21	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

QC Batch: 513905

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10414412002

METHOD BLANK: 2794624

Matrix: Water

Associated Lab Samples: 10414412002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/15/17 13:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/15/17 13:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/15/17 13:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/15/17 13:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/15/17 13:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/15/17 13:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/15/17 13:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/15/17 13:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/15/17 13:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/15/17 13:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/15/17 13:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/15/17 13:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/15/17 13:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/15/17 13:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/15/17 13:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/15/17 13:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/15/17 13:24	
Acetone	ug/L	<8.8	20.0	8.8	12/15/17 13:24	
Acrolein	ug/L	<4.8	10.0	4.8	12/15/17 13:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/15/17 13:24	
Benzene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/15/17 13:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
Bromoform	ug/L	<1.0	4.0	1.0	12/15/17 13:24	
Bromomethane	ug/L	<1.5	4.0	1.5	12/15/17 13:24	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/15/17 13:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/15/17 13:24	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

METHOD BLANK: 2794624

Matrix: Water

Associated Lab Samples: 10414412002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Chloroethane	ug/L	<0.44	1.0	0.44	12/15/17 13:24	
Chloroform	ug/L	<0.46	1.0	0.46	12/15/17 13:24	
Chloromethane	ug/L	<1.1	4.0	1.1	12/15/17 13:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/15/17 13:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/15/17 13:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/15/17 13:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/15/17 13:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/15/17 13:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/15/17 13:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/15/17 13:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Naphthalene	ug/L	<0.42	1.0	0.42	12/15/17 13:24	
o-Xylene	ug/L	<0.11	0.50	0.11	12/15/17 13:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Styrene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/15/17 13:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/15/17 13:24	
Toluene	ug/L	<0.17	0.50	0.17	12/15/17 13:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/15/17 13:24	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/15/17 13:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/15/17 13:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/15/17 13:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/15/17 13:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/15/17 13:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		12/15/17 13:24	
4-Bromofluorobenzene (S)	%	96	75-125		12/15/17 13:24	
Toluene-d8 (S)	%	98	75-125		12/15/17 13:24	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

LABORATORY CONTROL SAMPLE: 2794625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	110	75-136	
1,1,1-Trichloroethane	ug/L	20	20.5	102	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	17.2	86	71-138	
1,1,2-Trichloroethane	ug/L	20	19.6	98	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.1	90	69-126	
1,1-Dichloroethane	ug/L	20	19.1	96	75-125	
1,1-Dichloroethene	ug/L	20	18.7	93	75-125	
1,1-Dichloropropene	ug/L	20	18.7	93	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.0	100	75-125	
1,2,3-Trichloropropane	ug/L	20	20.7	103	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.3	96	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.1	95	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	47.6	95	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	18.7	94	75-125	
1,2-Dichlorobenzene	ug/L	20	20.7	103	75-125	
1,2-Dichloroethane	ug/L	20	19.8	99	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	94	75-125	
1,2-Dichloropropane	ug/L	20	17.2	86	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.8	99	75-125	
1,3-Dichlorobenzene	ug/L	20	20.6	103	75-125	
1,3-Dichloropropane	ug/L	20	19.2	96	75-125	
1,4-Dichlorobenzene	ug/L	20	21.2	106	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	362	91	64-140	
2,2,4-Trimethylpentane	ug/L	20	18.5	93	68-125	
2,2-Dichloropropane	ug/L	20	20.3	102	70-131	
2-Butanone (MEK)	ug/L	100	91.8	92	69-125	
2-Chlorotoluene	ug/L	20	19.6	98	75-125	
2-Hexanone	ug/L	100	94.8	95	73-129	
4-Chlorotoluene	ug/L	20	18.7	93	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.6	98	73-125	
Acetone	ug/L	100	119	119	66-126	
Acrolein	ug/L	200	183	92	56-150	
Acrylonitrile	ug/L	200	180	90	68-129	
Benzene	ug/L	20	19.1	95	75-125	
Bromobenzene	ug/L	20	21.1	105	75-125	
Bromochloromethane	ug/L	20	19.9	100	75-126	
Bromodichloromethane	ug/L	20	18.0	90	75-133	
Bromoform	ug/L	20	19.8	99	62-142	
Bromomethane	ug/L	20	16.8	84	34-143	
Carbon disulfide	ug/L	20	16.5	83	71-125	
Carbon tetrachloride	ug/L	20	21.4	107	71-145	
Chlorobenzene	ug/L	20	20.8	104	75-125	
Chloroethane	ug/L	20	19.5	97	75-125	
Chloroform	ug/L	20	19.1	96	75-125	
Chloromethane	ug/L	20	16.7	84	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.5	92	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.0	90	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

LABORATORY CONTROL SAMPLE: 2794625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	20.8	104	74-141	
Dibromomethane	ug/L	20	19.4	97	75-125	
Dichlorodifluoromethane	ug/L	20	20.2	101	59-130	
Dichlorofluoromethane	ug/L	20	19.5	97	75-125	
Diisopropyl ether	ug/L	20	18.4	92	69-125	
Ethyl-tert-butyl ether	ug/L	20	17.9	90	73-125	
Ethylbenzene	ug/L	20	20.6	103	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.1	111	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.5	97	75-125	
m&p-Xylene	ug/L	40	42.9	107	75-125	
Methyl-tert-butyl ether	ug/L	20	19.0	95	75-125	
Methylene Chloride	ug/L	20	17.0	85	73-125	
n-Butylbenzene	ug/L	20	19.0	95	75-125	
n-Propylbenzene	ug/L	20	18.6	93	75-125	
Naphthalene	ug/L	20	18.1	90	74-125	
o-Xylene	ug/L	20	19.3	96	75-125	
p-Isopropyltoluene	ug/L	20	20.0	100	75-125	
sec-Butylbenzene	ug/L	20	19.6	98	75-125	
Styrene	ug/L	20	19.3	97	75-125	
tert-Amylmethyl ether	ug/L	20	19.5	98	71-126	
tert-Butyl Alcohol	ug/L	200	221	110	69-131	
tert-Butylbenzene	ug/L	20	19.4	97	75-125	
Tetrachloroethene	ug/L	20	19.5	97	75-125	
Tetrahydrofuran	ug/L	200	240	120	65-127	
Toluene	ug/L	20	20.1	100	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	42.3	85	30-150	
Trichloroethene	ug/L	20	20.9	105	75-125	
Trichlorofluoromethane	ug/L	20	21.3	106	71-140	
Vinyl acetate	ug/L	20	17.0	85	68-137	
Vinyl chloride	ug/L	20	18.2	91	70-125	
Xylene (Total)	ug/L	60	62.2	104	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			91	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794626 2794627

Parameter	Units	10414415001		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.29	40	40	40	41.6	42.8	104	107	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.30	40	40	40	41.5	43.0	104	108	75-139	4	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	40	40	40	33.4	35.7	84	89	60-142	6	30	
1,1,2-Trichloroethane	ug/L	<0.44	40	40	40	36.9	37.6	92	94	75-128	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

Parameter	Units	10414415001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
1,1,2-Trichlorotrifluoroethane	ug/L	<0.55	40	40	40.7	41.4	102	103	62-150	2	30					
1,1-Dichloroethane	ug/L	<0.29	40	40	38.1	38.7	95	97	70-129	2	30					
1,1-Dichloroethene	ug/L	<0.36	40	40	38.2	38.1	95	95	67-141	0	30					
1,1-Dichloropropene	ug/L	<0.35	40	40	38.0	38.4	95	96	64-144	1	30					
1,2,3-Trichlorobenzene	ug/L	<0.29	40	40	42.0	44.8	105	112	66-139	7	30					
1,2,3-Trichloropropane	ug/L	<1.3	40	40	40.0	40.2	100	100	69-134	1	30					
1,2,4-Trichlorobenzene	ug/L	<0.36	40	40	38.4	40.9	96	102	65-138	6	30					
1,2,4-Trimethylbenzene	ug/L	<0.20	40	40	37.7	39.5	94	99	65-143	4	30					
1,2-Dibromo-3-chloropropane	ug/L	<2.1	100	100	93.4	101	93	101	61-134	8	30					
1,2-Dibromoethane (EDB)	ug/L	<0.34	40	40	35.5	36.0	89	90	74-129	1	30					
1,2-Dichlorobenzene	ug/L	<0.42	40	40	38.6	41.4	96	103	68-135	7	30					
1,2-Dichloroethane	ug/L	<0.30	40	40	37.5	38.2	94	96	73-125	2	30					
1,2-Dichloroethene (Total)	ug/L	<0.82	80	80	74.1	75.8	93	95	69-134	2	30					
1,2-Dichloropropane	ug/L	<1.2	40	40	33.0	34.2	82	86	64-130	4	30					
1,3,5-Trimethylbenzene	ug/L	<0.36	40	40	38.6	40.6	97	102	64-146	5	30					
1,3-Dichlorobenzene	ug/L	<0.32	40	40	39.3	41.8	98	104	69-135	6	30					
1,3-Dichloropropane	ug/L	<0.26	40	40	35.6	37.3	89	93	67-128	5	30					
1,4-Dichlorobenzene	ug/L	<0.21	40	40	40.2	42.4	101	106	66-134	5	30					
1,4-Dioxane (p-Dioxane)	ug/L	<45.2	800	800	699	697	87	87	58-140	0	30					
2,2,4-Trimethylpentane	ug/L	<2.6	40	40	40.2	41.1	101	103	48-150	2	30					
2,2-Dichloropropane	ug/L	<0.79	40	40	40.4	41.9	101	105	50-150	4	30					
2-Butanone (MEK)	ug/L	<4.8	200	200	183	181	92	91	58-125	1	30					
2-Chlorotoluene	ug/L	<0.41	40	40	39.0	40.5	97	101	65-138	4	30					
2-Hexanone	ug/L	<5.0	200	200	180	186	90	93	61-134	3	30					
4-Chlorotoluene	ug/L	<0.26	40	40	35.4	37.7	89	94	68-135	6	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<1.1	200	200	186	189	93	95	61-130	2	30					
Acetone	ug/L	<17.7	200	200	296	325	148	163	51-140	9	30	M1				
Acrolein	ug/L	<9.7	400	400	407	407	102	102	48-150	0	30					
Acrylonitrile	ug/L	<9.8	400	400	343	350	86	87	55-134	2	30					
Benzene	ug/L	<0.25	40	40	37.8	38.8	95	97	63-132	2	30					
Bromobenzene	ug/L	<0.31	40	40	39.5	42.6	99	106	67-138	8	30					
Bromochloromethane	ug/L	<0.76	40	40	37.7	38.6	94	97	66-138	2	30					
Bromodichloromethane	ug/L	<0.40	40	40	35.1	34.7	88	87	75-137	1	30					
Bromoform	ug/L	<2.1	40	40	38.8	39.6	97	99	65-129	2	30					
Bromomethane	ug/L	<3.1	40	40	36.5	38.9	91	97	41-150	6	30					
Carbon disulfide	ug/L	1.5J	40	40	34.0	35.8	81	86	72-132	5	30					
Carbon tetrachloride	ug/L	289	40	40	323	313	87	60	75-150	3	30	M1				
Chlorobenzene	ug/L	<0.27	40	40	40.0	40.2	100	100	73-127	0	30					
Chloroethane	ug/L	<0.88	40	40	39.1	38.6	98	96	74-138	1	30					
Chloroform	ug/L	10.2	40	40	46.8	46.8	92	92	74-125	0	30					
Chloromethane	ug/L	<2.2	40	40	33.2	32.8	83	82	58-129	1	30					
cis-1,2-Dichloroethene	ug/L	<0.40	40	40	35.4	36.3	88	91	63-135	3	30					
cis-1,3-Dichloropropene	ug/L	<0.23	40	40	33.1	33.7	83	84	66-129	2	30					
Dibromochloromethane	ug/L	<0.27	40	40	40.8	40.9	102	102	75-133	0	30					

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

Parameter	Units	10414415001		2794626		2794627		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<1.0	40	40	37.3	36.8	93	92	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.63	40	40	45.8	45.4	115	114	72-150	1	30		
Dichlorofluoromethane	ug/L	<0.77	40	40	39.8	38.5	99	96	75-129	3	30		
Diisopropyl ether	ug/L	<0.25	40	40	36.1	36.6	90	91	62-128	1	30		
Ethyl-tert-butyl ether	ug/L	<0.26	40	40	34.9	35.9	87	90	63-132	3	30		
Ethylbenzene	ug/L	<0.27	40	40	39.4	41.6	98	104	72-130	6	30		
Hexachloro-1,3-butadiene	ug/L	<0.96	40	40	42.6	47.7	107	119	71-150	11	30		
Isopropylbenzene (Cumene)	ug/L	<0.28	40	40	38.3	39.5	96	99	70-136	3	30		
m&p-Xylene	ug/L	<0.49	80	80	80.2	84.7	100	106	64-142	5	30		
Methyl-tert-butyl ether	ug/L	<0.29	40	40	36.8	37.9	92	95	72-125	3	30		
Methylene Chloride	ug/L	<2.3	40	40	32.7	33.2	82	83	60-132	1	30		
n-Butylbenzene	ug/L	<0.27	40	40	38.0	40.6	95	101	60-150	7	30		
n-Propylbenzene	ug/L	<0.25	40	40	36.3	38.7	91	97	63-142	6	30		
Naphthalene	ug/L	<0.84	40	40	37.3	39.6	93	99	67-125	6	30		
o-Xylene	ug/L	<0.22	40	40	38.4	39.7	96	99	60-143	3	30		
p-Isopropyltoluene	ug/L	<0.28	40	40	38.2	40.6	96	101	64-146	6	30		
sec-Butylbenzene	ug/L	<0.25	40	40	38.7	40.7	97	102	67-144	5	30		
Styrene	ug/L	<0.29	40	40	37.8	38.9	94	97	67-136	3	30		
tert-Amylmethyl ether	ug/L	<0.23	40	40	37.1	38.0	93	95	60-134	2	30		
tert-Butyl Alcohol	ug/L	<4.4	400	400	421	398	105	100	56-146	6	30		
tert-Butylbenzene	ug/L	<0.29	40	40	38.7	41.1	97	103	68-135	6	30		
Tetrachloroethene	ug/L	<0.32	40	40	39.4	39.5	98	99	67-148	0	30		
Tetrahydrofuran	ug/L	<8.6	400	400	608	644	152	161	51-141	6	30	M1	
Toluene	ug/L	<0.34	40	40	39.4	40.0	98	100	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.42	40	40	38.7	39.5	97	99	62-138	2	30		
trans-1,3-Dichloropropene	ug/L	<0.27	40	40	36.2	38.4	91	96	67-134	6	30		
trans-1,4-Dichloro-2-butene	ug/L	<5.7	100	100	76.9	82.2	77	82	30-150	7	30		
Trichloroethene	ug/L	<0.36	40	40	40.6	41.6	101	104	64-149	2	30		
Trichlorofluoromethane	ug/L	<0.26	40	40	45.7	45.4	114	113	75-150	1	30		
Vinyl acetate	ug/L	<3.0	40	40	33.8	34.9	84	87	49-143	3	30		
Vinyl chloride	ug/L	<0.19	40	40	38.3	38.0	96	95	75-133	1	30		
Xylene (Total)	ug/L	<0.49	120	120	119	124	99	104	63-142	5	30		
1,2-Dichloroethane-d4 (S)	%						98	95	75-137				
4-Bromofluorobenzene (S)	%						95	95	75-125				
Toluene-d8 (S)	%						97	96	75-125				

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

QC Batch: 513906

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10414412001

METHOD BLANK: 2794628

Matrix: Water

Associated Lab Samples: 10414412001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/16/17 01:31	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/16/17 01:31	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/16/17 01:31	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/16/17 01:31	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/16/17 01:31	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/16/17 01:31	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/16/17 01:31	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/16/17 01:31	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/16/17 01:31	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/16/17 01:31	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/16/17 01:31	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/16/17 01:31	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/16/17 01:31	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/16/17 01:31	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/16/17 01:31	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/16/17 01:31	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/16/17 01:31	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/16/17 01:31	
Acetone	ug/L	<8.8	20.0	8.8	12/16/17 01:31	
Acrolein	ug/L	<4.8	10.0	4.8	12/16/17 01:31	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/16/17 01:31	
Benzene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/16/17 01:31	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
Bromoform	ug/L	<1.0	4.0	1.0	12/16/17 01:31	
Bromomethane	ug/L	<1.5	4.0	1.5	12/16/17 01:31	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/16/17 01:31	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/16/17 01:31	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

METHOD BLANK: 2794628

Matrix: Water

Associated Lab Samples: 10414412001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Chloroethane	ug/L	<0.44	1.0	0.44	12/16/17 01:31	
Chloroform	ug/L	<0.46	1.0	0.46	12/16/17 01:31	
Chloromethane	ug/L	<1.1	4.0	1.1	12/16/17 01:31	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/16/17 01:31	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/16/17 01:31	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/16/17 01:31	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/16/17 01:31	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/16/17 01:31	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/16/17 01:31	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/16/17 01:31	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/16/17 01:31	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Naphthalene	ug/L	<0.42	1.0	0.42	12/16/17 01:31	
o-Xylene	ug/L	<0.11	0.50	0.11	12/16/17 01:31	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
Styrene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/16/17 01:31	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/16/17 01:31	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/16/17 01:31	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/16/17 01:31	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/16/17 01:31	
Toluene	ug/L	<0.17	0.50	0.17	12/16/17 01:31	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/16/17 01:31	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/16/17 01:31	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/16/17 01:31	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/16/17 01:31	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/16/17 01:31	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/16/17 01:31	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/16/17 01:31	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/16/17 01:31	
1,2-Dichloroethane-d4 (S)	%	96	75-137		12/16/17 01:31	
4-Bromofluorobenzene (S)	%	94	75-125		12/16/17 01:31	
Toluene-d8 (S)	%	99	75-125		12/16/17 01:31	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

LABORATORY CONTROL SAMPLE: 2794629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.5	107	75-136	
1,1,1-Trichloroethane	ug/L	20	18.1	90	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	17.3	87	71-138	
1,1,2-Trichloroethane	ug/L	20	18.9	95	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.9	89	69-126	
1,1-Dichloroethane	ug/L	20	19.1	95	75-125	
1,1-Dichloroethene	ug/L	20	17.9	90	75-125	
1,1-Dichloropropene	ug/L	20	15.7	79	75-125	
1,2,3-Trichlorobenzene	ug/L	20	18.0	90	75-125	
1,2,3-Trichloropropane	ug/L	20	20.4	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	17.6	88	75-125	
1,2,4-Trimethylbenzene	ug/L	20	18.4	92	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	46.9	94	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	19.1	96	75-125	
1,2-Dichlorobenzene	ug/L	20	18.8	94	75-125	
1,2-Dichloroethane	ug/L	20	19.5	98	70-125	
1,2-Dichloroethene (Total)	ug/L	40	36.8	92	75-125	
1,2-Dichloropropane	ug/L	20	17.8	89	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.1	90	75-125	
1,3-Dichlorobenzene	ug/L	20	19.7	99	75-125	
1,3-Dichloropropane	ug/L	20	19.6	98	75-125	
1,4-Dichlorobenzene	ug/L	20	19.5	97	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	391	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	14.1	70	68-125	
2,2-Dichloropropane	ug/L	20	16.5	83	70-131	
2-Butanone (MEK)	ug/L	100	73.0	73	69-125	
2-Chlorotoluene	ug/L	20	18.8	94	75-125	
2-Hexanone	ug/L	100	94.1	94	73-129	
4-Chlorotoluene	ug/L	20	17.4	87	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.2	99	73-125	
Acetone	ug/L	100	119	119	66-126	
Acrolein	ug/L	200	185	93	56-150	
Acrylonitrile	ug/L	200	184	92	68-129	
Benzene	ug/L	20	18.7	94	75-125	
Bromobenzene	ug/L	20	20.8	104	75-125	
Bromochloromethane	ug/L	20	17.1	86	75-126	
Bromodichloromethane	ug/L	20	18.7	94	75-133	
Bromoform	ug/L	20	19.9	99	62-142	
Bromomethane	ug/L	20	15.5	77	34-143	
Carbon disulfide	ug/L	20	15.9	79	71-125	
Carbon tetrachloride	ug/L	20	19.1	96	71-145	
Chlorobenzene	ug/L	20	20.1	100	75-125	
Chloroethane	ug/L	20	19.1	95	75-125	
Chloroform	ug/L	20	18.6	93	75-125	
Chloromethane	ug/L	20	16.1	80	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.1	91	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.4	92	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

LABORATORY CONTROL SAMPLE: 2794629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.1	105	74-141	
Dibromomethane	ug/L	20	20.7	104	75-125	
Dichlorodifluoromethane	ug/L	20	19.4	97	59-130	
Dichlorofluoromethane	ug/L	20	18.9	95	75-125	
Diisopropyl ether	ug/L	20	18.3	92	69-125	
Ethyl-tert-butyl ether	ug/L	20	18.3	91	73-125	
Ethylbenzene	ug/L	20	19.8	99	75-125	
Hexachloro-1,3-butadiene	ug/L	20	18.5	93	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.1	95	75-125	
m&p-Xylene	ug/L	40	41.5	104	75-125	
Methyl-tert-butyl ether	ug/L	20	19.2	96	75-125	
Methylene Chloride	ug/L	20	16.5	82	73-125	
n-Butylbenzene	ug/L	20	17.4	87	75-125	
n-Propylbenzene	ug/L	20	17.3	86	75-125	
Naphthalene	ug/L	20	16.2	81	74-125	
o-Xylene	ug/L	20	19.3	96	75-125	
p-Isopropyltoluene	ug/L	20	18.5	93	75-125	
sec-Butylbenzene	ug/L	20	18.0	90	75-125	
Styrene	ug/L	20	19.7	99	75-125	
tert-Amylmethyl ether	ug/L	20	19.2	96	71-126	
tert-Butyl Alcohol	ug/L	200	244	122	69-131	
tert-Butylbenzene	ug/L	20	18.5	92	75-125	
Tetrachloroethene	ug/L	20	19.3	96	75-125	
Tetrahydrofuran	ug/L	200	187	94	65-127	
Toluene	ug/L	20	19.3	97	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.7	94	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.2	96	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	39.0	78	30-150	
Trichloroethene	ug/L	20	20.0	100	75-125	
Trichlorofluoromethane	ug/L	20	20.7	103	71-140	
Vinyl acetate	ug/L	20	17.2	86	68-137	
Vinyl chloride	ug/L	20	17.2	86	70-125	
Xylene (Total)	ug/L	60	60.7	101	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			93	75-125	
Toluene-d8 (S)	%			96	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630 2794631

Parameter	Units	10414412001		MSD		MSD		MS		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	20.7	19.9	104	100	75-137	4	30		
1,1,1-Trichloroethane	ug/L	<0.15	20	20	20.3	18.1	101	91	75-139	11	30		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	16.8	17.6	84	88	60-142	5	30		
1,1,2-Trichloroethane	ug/L	<0.22	20	20	18.3	17.7	91	88	75-128	3	30		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

Parameter	Units	10414412001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630 2794631																
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	20.1	19.4	100	97	62-150	3	30					
1,1-Dichloroethane	ug/L	<0.14	20	20	18.8	19.4	94	97	70-129	3	30					
1,1-Dichloroethene	ug/L	<0.18	20	20	18.5	18.3	92	92	67-141	1	30					
1,1-Dichloropropene	ug/L	<0.18	20	20	17.5	15.7	87	78	64-144	11	30					
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	20.9	20.1	105	100	66-139	4	30					
1,2,3-Trichloropropane	ug/L	<0.66	20	20	20.2	20.5	101	103	69-134	2	30					
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	18.8	18.8	94	94	65-138	0	30					
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	18.5	18.3	92	92	65-143	1	30					
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	47.2	48.0	94	96	61-134	2	30					
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	17.7	17.3	88	87	74-129	2	30					
1,2-Dichlorobenzene	ug/L	<0.21	20	20	19.8	19.7	99	99	68-135	1	30					
1,2-Dichloroethane	ug/L	<0.15	20	20	18.9	18.3	94	92	73-125	3	30					
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	35.5	38.0	89	95	69-134	7	30					
1,2-Dichloropropane	ug/L	<0.62	20	20	16.4	17.2	82	86	64-130	5	30					
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	18.7	18.6	94	93	64-146	1	30					
1,3-Dichlorobenzene	ug/L	<0.16	20	20	20.1	20.0	100	100	69-135	0	30					
1,3-Dichloropropane	ug/L	<0.13	20	20	18.7	18.0	93	90	67-128	4	30					
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	19.6	98	98	66-134	0	30					
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	362	346	90	86	58-140	4	30					
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	16.8	16.3	84	81	48-150	3	30					
2,2-Dichloropropane	ug/L	<0.40	20	20	17.6	17.4	88	87	50-150	1	30					
2-Butanone (MEK)	ug/L	<2.4	100	100	80.6	65.4	81	65	58-125	21	30					
2-Chlorotoluene	ug/L	<0.20	20	20	19.0	18.8	95	94	65-138	1	30					
2-Hexanone	ug/L	<2.5	100	100	90.9	89.1	91	89	61-134	2	30					
4-Chlorotoluene	ug/L	<0.13	20	20	17.7	17.8	88	89	68-135	1	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	94.3	91.6	94	92	61-130	3	30					
Acetone	ug/L	<8.8	100	100	143	155	143	155	51-140	8	30	M1				
Acrolein	ug/L	<4.8	200	200	187	191	94	96	48-150	2	30					
Acrylonitrile	ug/L	<4.9	200	200	168	179	84	89	55-134	6	30					
Benzene	ug/L	<0.13	20	20	17.6	17.6	88	88	63-132	0	30					
Bromobenzene	ug/L	<0.16	20	20	20.3	20.4	102	102	67-138	0	30					
Bromochloromethane	ug/L	<0.38	20	20	18.3	16.8	91	84	66-138	8	30					
Bromodichloromethane	ug/L	<0.20	20	20	16.8	18.2	84	91	75-137	8	30					
Bromoform	ug/L	<1.0	20	20	18.2	19.2	91	96	65-129	5	30					
Bromomethane	ug/L	<1.5	20	20	17.7	18.3	88	91	41-150	3	30					
Carbon disulfide	ug/L	0.66J	20	20	17.1	17.1	82	82	72-132	0	30					
Carbon tetrachloride	ug/L	134	20	20	148	137	74	15	75-150	8	30	M1				
Chlorobenzene	ug/L	<0.14	20	20	19.6	18.8	98	94	73-127	4	30					
Chloroethane	ug/L	<0.44	20	20	19.9	20.6	99	103	74-138	3	30					
Chloroform	ug/L	9.4	20	20	25.6	23.8	81	72	74-125	7	30	M1				
Chloromethane	ug/L	<1.1	20	20	16.8	16.4	84	82	58-129	2	30					
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	16.3	18.5	81	93	63-135	13	30					
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	15.5	17.6	77	88	66-129	13	30					
Dibromochloromethane	ug/L	<0.13	20	20	20.5	20.0	102	100	75-133	2	30					

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794630												2794631											
Parameter	Units	10414412001		MS		MSD		MS		MSD		% Rec		Max		Qual							
		Result	Conc.	Spike Conc.	MSD Spike Conc.	Result	MSD Result	% Rec	MSD % Rec	Limits	RPD	RPD											
Dibromomethane	ug/L	<0.50	20	20	18.1	20.0	90	100	68-134	10	30												
Dichlorodifluoromethane	ug/L	<0.31	20	20	22.4	21.9	112	110	72-150	2	30												
Dichlorofluoromethane	ug/L	<0.38	20	20	19.6	20.1	98	101	75-129	2	30												
Diisopropyl ether	ug/L	<0.12	20	20	17.9	18.1	90	91	62-128	1	30												
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	16.7	17.9	83	90	63-132	7	30												
Ethylbenzene	ug/L	<0.14	20	20	19.6	19.1	98	96	72-130	2	30												
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	21.2	20.0	106	100	71-150	6	30												
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	19.0	18.2	95	91	70-136	4	30												
m&p-Xylene	ug/L	<0.24	40	40	41.8	39.7	104	99	64-142	5	30												
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.5	18.6	92	93	72-125	1	30												
Methylene Chloride	ug/L	<1.2	20	20	16.2	16.9	81	85	60-132	4	30												
n-Butylbenzene	ug/L	<0.13	20	20	18.3	17.6	92	88	60-150	4	30												
n-Propylbenzene	ug/L	<0.12	20	20	18.2	17.7	91	89	63-142	3	30												
Naphthalene	ug/L	<0.42	20	20	18.8	18.7	94	93	67-125	1	30												
o-Xylene	ug/L	<0.11	20	20	18.8	18.3	94	92	60-143	3	30												
p-Isopropyltoluene	ug/L	<0.14	20	20	18.8	18.5	94	92	64-146	2	30												
sec-Butylbenzene	ug/L	<0.12	20	20	19.0	18.4	95	92	67-144	3	30												
Styrene	ug/L	<0.14	20	20	18.0	17.4	90	87	67-136	3	30												
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.6	17.9	93	89	60-134	4	30												
tert-Butyl Alcohol	ug/L	<2.2	200	200	222	206	111	103	56-146	7	30												
tert-Butylbenzene	ug/L	<0.15	20	20	19.0	18.2	95	91	68-135	4	30												
Tetrachloroethene	ug/L	<0.16	20	20	19.2	18.5	96	92	67-148	4	30												
Tetrahydrofuran	ug/L	<4.3	200	200	270	233	135	116	51-141	15	30												
Toluene	ug/L	<0.17	20	20	18.9	18.3	94	92	61-140	3	30												
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.3	19.5	96	97	62-138	1	30												
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	18.4	17.7	92	88	67-134	4	30												
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	37.0	38.0	74	76	30-150	3	30												
Trichloroethene	ug/L	<0.18	20	20	19.9	20.6	100	103	64-149	3	30												
Trichlorofluoromethane	ug/L	<0.13	20	20	22.7	22.9	114	114	75-150	1	30												
Vinyl acetate	ug/L	<1.5	20	20	14.5	15.7	73	79	49-143	8	30												
Vinyl chloride	ug/L	<0.096	20	20	18.9	19.2	95	96	75-133	1	30												
Xylene (Total)	ug/L	<0.24	60	60	60.5	58.0	101	97	63-142	4	30												
1,2-Dichloroethane-d4 (S)	%						96	97	75-137														
4-Bromofluorobenzene (S)	%						94	94	75-125														
Toluene-d8 (S)	%						96	95	75-125														

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414412

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10414412001	Marlow-GW-121217	EPA 8260B	513906		
10414412002	Trip Blank-121217	EPA 8260B	513905		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10414412

**Section A**

**Section B**

**Section C**

Required Client Information:

Required Project Information:

Invoice Information:

Page : 1 Of 1

<b>Company:</b> CH2M Hill	<b>Report To:</b> Mark Ochsner, Brad Ostapkowicz	<b>Attention:</b> Anne Walsh
<b>Address:</b> 999 W. Riverside Ave, Suite 500 Spokane, WA 99201	<b>Copy To:</b> Steve Demus, Lindsey Baumann	<b>Company:</b> UPRR
<b>Email:</b>	<b>Copy To:</b> David Hodson, UPRR-Sysdat@ghd.com	<b>Address:</b> 1400 W. 52nd Ave, Denver, CO 80221
<b>Phone:</b>	<b>Purchase Order #:</b> PEDD# 1497	<b>Pace Quote:</b> Contract# 758938
<b>Fax:</b>	<b>Project Name:</b> Freeman WA-Grain Handling Facility	<b>Pace Project Manager:</b> Jennifer Gross
<b>Requested Due Date:</b> 10 Day Standard	<b>Project #:</b> 1497	<b>Pace Profile #:</b> 36447 / 4

Regulatory Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9, -, ) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test	Requested Analysis Filtered (Y/N)	MS/MSD Requested									
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Low Level VOCs by 8260				60107470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2
				DATE	TIME	DATE	TIME																					
1	Mapland -GW-121217	WT	G			12/17	1400	9																	MS/MSD COL			
2	Trip/Blank - 121217	WT	G			12/17	0700	1																	COL			
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in <b>bold</b>	LKB/CH2M	12-13-17	1202	EDM Pace	12/11/17	1200	1.1	Y	Y	Y
*Field filtered by client							3.3			
							2.1			

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	LKBaumann				
SIGNATURE of SAMPLER:	<i>LKBaumann</i>	DATE Signed:	12-13-17		

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: UPRR - CH2M Hill Project #: 10414412



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 7475 9392 9311 / 7475 9636 3971 / 7448 1033 0160

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  
 Samples on ice, cooling process has begun

Cooler Temp Read (°C): 1.0, 3.2, 2.0 Cooler Temp Corrected (°C): 1.1, 3.3, 2.1 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: ME 12/14/17

USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14. <u>1/9 vial &gt; 6mm Headspace 1/9 vial Partially</u>
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>1 Shared Trip Frozen</u>
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Blank</u>
Pace Trip Blank Lot # (if purchased): <u>140928</u>		

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1225</u>	Temp: <u>1.0, 3.2, 2.0</u>	Corrected <u>1.1, 3.3, 2.1</u>
Time: <u>1240</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_

JENNI GROSS

Date: 12/14/17  
 will be sent to the North Carolina DEHNR Certification Office ( i.e. out of

Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers)



December 21, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

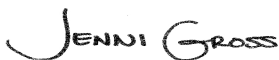
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414415

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 14, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414415

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414415001	Randall-GW-121217	Water	12/12/17 10:40	12/14/17 10:00
10414415002	Trip Blank-121217	Water	12/12/17 07:00	12/14/17 10:00

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414415001	Randall-GW-121217	EPA 8260B	DJB	83	PASI-M
10414415002	Trip Blank-121217	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414415001</b>	<b>Randall-GW-121217</b>					
EPA 8260B	Carbon disulfide	1.5J	ug/L	2.0	12/15/17 17:18	
EPA 8260B	Carbon tetrachloride	289	ug/L	1.0	12/15/17 17:18	M1
EPA 8260B	Chloroform	10.2	ug/L	2.0	12/15/17 17:18	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 21, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 513905

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414415001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2794626)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2794627)
  - Acetone
  - Carbon tetrachloride
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

Sample: **Randall-GW-121217** Lab ID: **10414415001** Collected: 12/12/17 10:40 Received: 12/14/17 10:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.29	ug/L	1.0	0.29	2		12/15/17 17:18	630-20-6	
1,1,1-Trichloroethane	<0.30	ug/L	1.0	0.30	2		12/15/17 17:18	71-55-6	
1,1,2,2-Tetrachloroethane	<0.38	ug/L	1.0	0.38	2		12/15/17 17:18	79-34-5	
1,1,2-Trichloroethane	<0.44	ug/L	1.0	0.44	2		12/15/17 17:18	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.55	ug/L	2.0	0.55	2		12/15/17 17:18	76-13-1	
1,1-Dichloroethane	<0.29	ug/L	1.0	0.29	2		12/15/17 17:18	75-34-3	
1,1-Dichloroethene	<0.36	ug/L	1.0	0.36	2		12/15/17 17:18	75-35-4	
1,1-Dichloropropene	<0.35	ug/L	1.0	0.35	2		12/15/17 17:18	563-58-6	
1,2,3-Trichlorobenzene	<0.29	ug/L	1.0	0.29	2		12/15/17 17:18	87-61-6	
1,2,3-Trichloropropane	<1.3	ug/L	8.0	1.3	2		12/15/17 17:18	96-18-4	
1,2,4-Trichlorobenzene	<0.36	ug/L	1.0	0.36	2		12/15/17 17:18	120-82-1	
1,2,4-Trimethylbenzene	<0.20	ug/L	1.0	0.20	2		12/15/17 17:18	95-63-6	
1,2-Dibromo-3-chloropropane	<2.1	ug/L	8.0	2.1	2		12/15/17 17:18	96-12-8	
1,2-Dibromoethane (EDB)	<0.34	ug/L	1.0	0.34	2		12/15/17 17:18	106-93-4	
1,2-Dichlorobenzene	<0.42	ug/L	1.0	0.42	2		12/15/17 17:18	95-50-1	
1,2-Dichloroethane	<0.30	ug/L	1.0	0.30	2		12/15/17 17:18	107-06-2	
1,2-Dichloroethene (Total)	<0.82	ug/L	2.0	0.82	2		12/15/17 17:18	540-59-0	
1,2-Dichloropropane	<1.2	ug/L	8.0	1.2	2		12/15/17 17:18	78-87-5	
1,3,5-Trimethylbenzene	<0.36	ug/L	1.0	0.36	2		12/15/17 17:18	108-67-8	
1,3-Dichlorobenzene	<0.32	ug/L	1.0	0.32	2		12/15/17 17:18	541-73-1	
1,3-Dichloropropane	<0.26	ug/L	1.0	0.26	2		12/15/17 17:18	142-28-9	
1,4-Dichlorobenzene	<0.21	ug/L	1.0	0.21	2		12/15/17 17:18	106-46-7	
1,4-Dioxane (p-Dioxane)	<45.2	ug/L	400	45.2	2		12/15/17 17:18	123-91-1	
2,2,4-Trimethylpentane	<2.6	ug/L	8.0	2.6	2		12/15/17 17:18	540-84-1	
2,2-Dichloropropane	<0.79	ug/L	2.0	0.79	2		12/15/17 17:18	594-20-7	
2-Butanone (MEK)	<4.8	ug/L	10.0	4.8	2		12/15/17 17:18	78-93-3	
2-Chlorotoluene	<0.41	ug/L	1.0	0.41	2		12/15/17 17:18	95-49-8	
2-Hexanone	<5.0	ug/L	10.0	5.0	2		12/15/17 17:18	591-78-6	
4-Chlorotoluene	<0.26	ug/L	1.0	0.26	2		12/15/17 17:18	106-43-4	
4-Methyl-2-pentanone (MIBK)	<1.1	ug/L	10.0	1.1	2		12/15/17 17:18	108-10-1	
Acetone	<17.7	ug/L	40.0	17.7	2		12/15/17 17:18	67-64-1	M1
Acrolein	<9.7	ug/L	20.0	9.7	2		12/15/17 17:18	107-02-8	
Acrylonitrile	<9.8	ug/L	20.0	9.8	2		12/15/17 17:18	107-13-1	
Benzene	<0.25	ug/L	1.0	0.25	2		12/15/17 17:18	71-43-2	
Bromobenzene	<0.31	ug/L	1.0	0.31	2		12/15/17 17:18	108-86-1	
Bromochloromethane	<0.76	ug/L	2.0	0.76	2		12/15/17 17:18	74-97-5	
Bromodichloromethane	<0.40	ug/L	1.0	0.40	2		12/15/17 17:18	75-27-4	
Bromoform	<2.1	ug/L	8.0	2.1	2		12/15/17 17:18	75-25-2	
Bromomethane	<3.1	ug/L	8.0	3.1	2		12/15/17 17:18	74-83-9	
Carbon disulfide	1.5J	ug/L	2.0	0.74	2		12/15/17 17:18	75-15-0	
Carbon tetrachloride	289	ug/L	1.0	0.40	2		12/15/17 17:18	56-23-5	M1
Chlorobenzene	<0.27	ug/L	1.0	0.27	2		12/15/17 17:18	108-90-7	
Chloroethane	<0.88	ug/L	2.0	0.88	2		12/15/17 17:18	75-00-3	
Chloroform	10.2	ug/L	2.0	0.92	2		12/15/17 17:18	67-66-3	
Chloromethane	<2.2	ug/L	8.0	2.2	2		12/15/17 17:18	74-87-3	
Dibromochloromethane	<0.27	ug/L	1.0	0.27	2		12/15/17 17:18	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

**Sample: Randall-GW-121217**      **Lab ID: 10414415001**      Collected: 12/12/17 10:40      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<1.0	ug/L	2.0	1.0	2		12/15/17 17:18	74-95-3	
Dichlorodifluoromethane	<0.63	ug/L	2.0	0.63	2		12/15/17 17:18	75-71-8	
Dichlorofluoromethane	<0.77	ug/L	2.0	0.77	2		12/15/17 17:18	75-43-4	
Diisopropyl ether	<0.25	ug/L	2.0	0.25	2		12/15/17 17:18	108-20-3	
Ethyl-tert-butyl ether	<0.26	ug/L	1.0	0.26	2		12/15/17 17:18	637-92-3	
Ethylbenzene	<0.27	ug/L	1.0	0.27	2		12/15/17 17:18	100-41-4	
Hexachloro-1,3-butadiene	<0.96	ug/L	2.0	0.96	2		12/15/17 17:18	87-68-3	
Isopropylbenzene (Cumene)	<0.28	ug/L	1.0	0.28	2		12/15/17 17:18	98-82-8	
Methyl-tert-butyl ether	<0.29	ug/L	1.0	0.29	2		12/15/17 17:18	1634-04-4	
Methylene Chloride	<2.3	ug/L	8.0	2.3	2		12/15/17 17:18	75-09-2	
Naphthalene	<0.84	ug/L	2.0	0.84	2		12/15/17 17:18	91-20-3	
Styrene	<0.29	ug/L	1.0	0.29	2		12/15/17 17:18	100-42-5	
Tetrachloroethene	<0.32	ug/L	1.0	0.32	2		12/15/17 17:18	127-18-4	
Tetrahydrofuran	<8.6	ug/L	20.0	8.6	2		12/15/17 17:18	109-99-9	M1
Toluene	<0.34	ug/L	1.0	0.34	2		12/15/17 17:18	108-88-3	
Trichloroethene	<0.36	ug/L	0.80	0.36	2		12/15/17 17:18	79-01-6	
Trichlorofluoromethane	<0.26	ug/L	1.0	0.26	2		12/15/17 17:18	75-69-4	
Vinyl acetate	<3.0	ug/L	20.0	3.0	2		12/15/17 17:18	108-05-4	
Vinyl chloride	<0.19	ug/L	0.40	0.19	2		12/15/17 17:18	75-01-4	
Xylene (Total)	<0.49	ug/L	3.0	0.49	2		12/15/17 17:18	1330-20-7	
cis-1,2-Dichloroethene	<0.40	ug/L	1.0	0.40	2		12/15/17 17:18	156-59-2	
cis-1,3-Dichloropropene	<0.23	ug/L	1.0	0.23	2		12/15/17 17:18	10061-01-5	
m&p-Xylene	<0.49	ug/L	2.0	0.49	2		12/15/17 17:18	179601-23-1	
n-Butylbenzene	<0.27	ug/L	1.0	0.27	2		12/15/17 17:18	104-51-8	
n-Propylbenzene	<0.25	ug/L	1.0	0.25	2		12/15/17 17:18	103-65-1	
o-Xylene	<0.22	ug/L	1.0	0.22	2		12/15/17 17:18	95-47-6	
p-Isopropyltoluene	<0.28	ug/L	1.0	0.28	2		12/15/17 17:18	99-87-6	
sec-Butylbenzene	<0.25	ug/L	1.0	0.25	2		12/15/17 17:18	135-98-8	
tert-Amylmethyl ether	<0.23	ug/L	1.0	0.23	2		12/15/17 17:18	994-05-8	
tert-Butyl Alcohol	<4.4	ug/L	20.0	4.4	2		12/15/17 17:18	75-65-0	
tert-Butylbenzene	<0.29	ug/L	1.0	0.29	2		12/15/17 17:18	98-06-6	
trans-1,2-Dichloroethene	<0.42	ug/L	1.0	0.42	2		12/15/17 17:18	156-60-5	
trans-1,3-Dichloropropene	<0.27	ug/L	1.0	0.27	2		12/15/17 17:18	10061-02-6	
trans-1,4-Dichloro-2-butene	<5.7	ug/L	20.0	5.7	2		12/15/17 17:18	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		2		12/15/17 17:18	17060-07-0	
Toluene-d8 (S)	97	%	75-125		2		12/15/17 17:18	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		2		12/15/17 17:18	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

**Sample: Trip Blank-121217**      **Lab ID: 10414415002**      Collected: 12/12/17 07:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/15/17 15:21	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/15/17 15:21	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/15/17 15:21	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/15/17 15:21	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/15/17 15:21	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/15/17 15:21	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/15/17 15:21	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/15/17 15:21	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/15/17 15:21	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/15/17 15:21	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/15/17 15:21	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/15/17 15:21	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/15/17 15:21	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/15/17 15:21	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/15/17 15:21	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/15/17 15:21	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/15/17 15:21	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/15/17 15:21	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/15/17 15:21	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/15/17 15:21	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/15/17 15:21	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/15/17 15:21	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/15/17 15:21	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/15/17 15:21	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/15/17 15:21	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/15/17 15:21	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/15/17 15:21	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/15/17 15:21	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/15/17 15:21	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/15/17 15:21	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/15/17 15:21	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/15/17 15:21	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

**Sample:** Trip Blank-121217      **Lab ID:** 10414415002      Collected: 12/12/17 07:00      Received: 12/14/17 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/15/17 15:21	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/15/17 15:21	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/15/17 15:21	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/15/17 15:21	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/15/17 15:21	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/15/17 15:21	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/15/17 15:21	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/15/17 15:21	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/15/17 15:21	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/15/17 15:21	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/15/17 15:21	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/15/17 15:21	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/15/17 15:21	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/15/17 15:21	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/15/17 15:21	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/15/17 15:21	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/15/17 15:21	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/15/17 15:21	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/15/17 15:21	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/15/17 15:21	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/15/17 15:21	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/15/17 15:21	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/15/17 15:21	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/15/17 15:21	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		12/15/17 15:21	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		12/15/17 15:21	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/15/17 15:21	460-00-4	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

QC Batch: 513905

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10414415001, 10414415002

METHOD BLANK: 2794624

Matrix: Water

Associated Lab Samples: 10414415001, 10414415002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/15/17 13:24	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/15/17 13:24	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/15/17 13:24	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/15/17 13:24	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/15/17 13:24	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/15/17 13:24	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/15/17 13:24	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/15/17 13:24	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/15/17 13:24	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/15/17 13:24	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/15/17 13:24	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/15/17 13:24	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/15/17 13:24	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/15/17 13:24	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/15/17 13:24	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/15/17 13:24	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/15/17 13:24	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/15/17 13:24	
Acetone	ug/L	<8.8	20.0	8.8	12/15/17 13:24	
Acrolein	ug/L	<4.8	10.0	4.8	12/15/17 13:24	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/15/17 13:24	
Benzene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/15/17 13:24	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
Bromoform	ug/L	<1.0	4.0	1.0	12/15/17 13:24	
Bromomethane	ug/L	<1.5	4.0	1.5	12/15/17 13:24	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/15/17 13:24	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/15/17 13:24	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

METHOD BLANK: 2794624

Matrix: Water

Associated Lab Samples: 10414415001, 10414415002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Chloroethane	ug/L	<0.44	1.0	0.44	12/15/17 13:24	
Chloroform	ug/L	<0.46	1.0	0.46	12/15/17 13:24	
Chloromethane	ug/L	<1.1	4.0	1.1	12/15/17 13:24	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/15/17 13:24	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/15/17 13:24	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/15/17 13:24	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/15/17 13:24	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/15/17 13:24	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/15/17 13:24	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/15/17 13:24	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/15/17 13:24	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Naphthalene	ug/L	<0.42	1.0	0.42	12/15/17 13:24	
o-Xylene	ug/L	<0.11	0.50	0.11	12/15/17 13:24	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
Styrene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/15/17 13:24	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/15/17 13:24	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/15/17 13:24	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/15/17 13:24	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/15/17 13:24	
Toluene	ug/L	<0.17	0.50	0.17	12/15/17 13:24	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/15/17 13:24	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/15/17 13:24	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/15/17 13:24	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/15/17 13:24	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/15/17 13:24	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/15/17 13:24	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/15/17 13:24	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/15/17 13:24	
1,2-Dichloroethane-d4 (S)	%	98	75-137		12/15/17 13:24	
4-Bromofluorobenzene (S)	%	96	75-125		12/15/17 13:24	
Toluene-d8 (S)	%	98	75-125		12/15/17 13:24	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

LABORATORY CONTROL SAMPLE: 2794625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.9	110	75-136	
1,1,1-Trichloroethane	ug/L	20	20.5	102	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	17.2	86	71-138	
1,1,2-Trichloroethane	ug/L	20	19.6	98	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.1	90	69-126	
1,1-Dichloroethane	ug/L	20	19.1	96	75-125	
1,1-Dichloroethene	ug/L	20	18.7	93	75-125	
1,1-Dichloropropene	ug/L	20	18.7	93	75-125	
1,2,3-Trichlorobenzene	ug/L	20	20.0	100	75-125	
1,2,3-Trichloropropane	ug/L	20	20.7	103	75-125	
1,2,4-Trichlorobenzene	ug/L	20	19.3	96	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.1	95	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	47.6	95	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	18.7	94	75-125	
1,2-Dichlorobenzene	ug/L	20	20.7	103	75-125	
1,2-Dichloroethane	ug/L	20	19.8	99	70-125	
1,2-Dichloroethene (Total)	ug/L	40	37.4	94	75-125	
1,2-Dichloropropane	ug/L	20	17.2	86	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.8	99	75-125	
1,3-Dichlorobenzene	ug/L	20	20.6	103	75-125	
1,3-Dichloropropane	ug/L	20	19.2	96	75-125	
1,4-Dichlorobenzene	ug/L	20	21.2	106	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	362	91	64-140	
2,2,4-Trimethylpentane	ug/L	20	18.5	93	68-125	
2,2-Dichloropropane	ug/L	20	20.3	102	70-131	
2-Butanone (MEK)	ug/L	100	91.8	92	69-125	
2-Chlorotoluene	ug/L	20	19.6	98	75-125	
2-Hexanone	ug/L	100	94.8	95	73-129	
4-Chlorotoluene	ug/L	20	18.7	93	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.6	98	73-125	
Acetone	ug/L	100	119	119	66-126	
Acrolein	ug/L	200	183	92	56-150	
Acrylonitrile	ug/L	200	180	90	68-129	
Benzene	ug/L	20	19.1	95	75-125	
Bromobenzene	ug/L	20	21.1	105	75-125	
Bromochloromethane	ug/L	20	19.9	100	75-126	
Bromodichloromethane	ug/L	20	18.0	90	75-133	
Bromoform	ug/L	20	19.8	99	62-142	
Bromomethane	ug/L	20	16.8	84	34-143	
Carbon disulfide	ug/L	20	16.5	83	71-125	
Carbon tetrachloride	ug/L	20	21.4	107	71-145	
Chlorobenzene	ug/L	20	20.8	104	75-125	
Chloroethane	ug/L	20	19.5	97	75-125	
Chloroform	ug/L	20	19.1	96	75-125	
Chloromethane	ug/L	20	16.7	84	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.5	92	75-125	
cis-1,3-Dichloropropene	ug/L	20	18.0	90	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

LABORATORY CONTROL SAMPLE: 2794625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	20.8	104	74-141	
Dibromomethane	ug/L	20	19.4	97	75-125	
Dichlorodifluoromethane	ug/L	20	20.2	101	59-130	
Dichlorofluoromethane	ug/L	20	19.5	97	75-125	
Diisopropyl ether	ug/L	20	18.4	92	69-125	
Ethyl-tert-butyl ether	ug/L	20	17.9	90	73-125	
Ethylbenzene	ug/L	20	20.6	103	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.1	111	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.5	97	75-125	
m&p-Xylene	ug/L	40	42.9	107	75-125	
Methyl-tert-butyl ether	ug/L	20	19.0	95	75-125	
Methylene Chloride	ug/L	20	17.0	85	73-125	
n-Butylbenzene	ug/L	20	19.0	95	75-125	
n-Propylbenzene	ug/L	20	18.6	93	75-125	
Naphthalene	ug/L	20	18.1	90	74-125	
o-Xylene	ug/L	20	19.3	96	75-125	
p-Isopropyltoluene	ug/L	20	20.0	100	75-125	
sec-Butylbenzene	ug/L	20	19.6	98	75-125	
Styrene	ug/L	20	19.3	97	75-125	
tert-Amylmethyl ether	ug/L	20	19.5	98	71-126	
tert-Butyl Alcohol	ug/L	200	221	110	69-131	
tert-Butylbenzene	ug/L	20	19.4	97	75-125	
Tetrachloroethene	ug/L	20	19.5	97	75-125	
Tetrahydrofuran	ug/L	200	240	120	65-127	
Toluene	ug/L	20	20.1	100	75-125	
trans-1,2-Dichloroethene	ug/L	20	18.9	95	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.0	95	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	42.3	85	30-150	
Trichloroethene	ug/L	20	20.9	105	75-125	
Trichlorofluoromethane	ug/L	20	21.3	106	71-140	
Vinyl acetate	ug/L	20	17.0	85	68-137	
Vinyl chloride	ug/L	20	18.2	91	70-125	
Xylene (Total)	ug/L	60	62.2	104	75-125	
1,2-Dichloroethane-d4 (S)	%			95	75-137	
4-Bromofluorobenzene (S)	%			91	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2794626 2794627

Parameter	Units	10414415001		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.29	40	40	40	41.6	42.8	104	107	75-137	3	30	
1,1,1-Trichloroethane	ug/L	<0.30	40	40	40	41.5	43.0	104	108	75-139	4	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.38	40	40	40	33.4	35.7	84	89	60-142	6	30	
1,1,2-Trichloroethane	ug/L	<0.44	40	40	40	36.9	37.6	92	94	75-128	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

Parameter	Units	10414415001		MS		MSD		MS		MSD		% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec							
1,1,2-Trichlorotrifluoroethane	ug/L	<0.55	40	40	40.7	41.4	102	103	62-150	2	30					
1,1-Dichloroethane	ug/L	<0.29	40	40	38.1	38.7	95	97	70-129	2	30					
1,1-Dichloroethene	ug/L	<0.36	40	40	38.2	38.1	95	95	67-141	0	30					
1,1-Dichloropropene	ug/L	<0.35	40	40	38.0	38.4	95	96	64-144	1	30					
1,2,3-Trichlorobenzene	ug/L	<0.29	40	40	42.0	44.8	105	112	66-139	7	30					
1,2,3-Trichloropropane	ug/L	<1.3	40	40	40.0	40.2	100	100	69-134	1	30					
1,2,4-Trichlorobenzene	ug/L	<0.36	40	40	38.4	40.9	96	102	65-138	6	30					
1,2,4-Trimethylbenzene	ug/L	<0.20	40	40	37.7	39.5	94	99	65-143	4	30					
1,2-Dibromo-3-chloropropane	ug/L	<2.1	100	100	93.4	101	93	101	61-134	8	30					
1,2-Dibromoethane (EDB)	ug/L	<0.34	40	40	35.5	36.0	89	90	74-129	1	30					
1,2-Dichlorobenzene	ug/L	<0.42	40	40	38.6	41.4	96	103	68-135	7	30					
1,2-Dichloroethane	ug/L	<0.30	40	40	37.5	38.2	94	96	73-125	2	30					
1,2-Dichloroethene (Total)	ug/L	<0.82	80	80	74.1	75.8	93	95	69-134	2	30					
1,2-Dichloropropane	ug/L	<1.2	40	40	33.0	34.2	82	86	64-130	4	30					
1,3,5-Trimethylbenzene	ug/L	<0.36	40	40	38.6	40.6	97	102	64-146	5	30					
1,3-Dichlorobenzene	ug/L	<0.32	40	40	39.3	41.8	98	104	69-135	6	30					
1,3-Dichloropropane	ug/L	<0.26	40	40	35.6	37.3	89	93	67-128	5	30					
1,4-Dichlorobenzene	ug/L	<0.21	40	40	40.2	42.4	101	106	66-134	5	30					
1,4-Dioxane (p-Dioxane)	ug/L	<45.2	800	800	699	697	87	87	58-140	0	30					
2,2,4-Trimethylpentane	ug/L	<2.6	40	40	40.2	41.1	101	103	48-150	2	30					
2,2-Dichloropropane	ug/L	<0.79	40	40	40.4	41.9	101	105	50-150	4	30					
2-Butanone (MEK)	ug/L	<4.8	200	200	183	181	92	91	58-125	1	30					
2-Chlorotoluene	ug/L	<0.41	40	40	39.0	40.5	97	101	65-138	4	30					
2-Hexanone	ug/L	<5.0	200	200	180	186	90	93	61-134	3	30					
4-Chlorotoluene	ug/L	<0.26	40	40	35.4	37.7	89	94	68-135	6	30					
4-Methyl-2-pentanone (MIBK)	ug/L	<1.1	200	200	186	189	93	95	61-130	2	30					
Acetone	ug/L	<17.7	200	200	296	325	148	163	51-140	9	30	M1				
Acrolein	ug/L	<9.7	400	400	407	407	102	102	48-150	0	30					
Acrylonitrile	ug/L	<9.8	400	400	343	350	86	87	55-134	2	30					
Benzene	ug/L	<0.25	40	40	37.8	38.8	95	97	63-132	2	30					
Bromobenzene	ug/L	<0.31	40	40	39.5	42.6	99	106	67-138	8	30					
Bromochloromethane	ug/L	<0.76	40	40	37.7	38.6	94	97	66-138	2	30					
Bromodichloromethane	ug/L	<0.40	40	40	35.1	34.7	88	87	75-137	1	30					
Bromoform	ug/L	<2.1	40	40	38.8	39.6	97	99	65-129	2	30					
Bromomethane	ug/L	<3.1	40	40	36.5	38.9	91	97	41-150	6	30					
Carbon disulfide	ug/L	1.5J	40	40	34.0	35.8	81	86	72-132	5	30					
Carbon tetrachloride	ug/L	289	40	40	323	313	87	60	75-150	3	30	M1				
Chlorobenzene	ug/L	<0.27	40	40	40.0	40.2	100	100	73-127	0	30					
Chloroethane	ug/L	<0.88	40	40	39.1	38.6	98	96	74-138	1	30					
Chloroform	ug/L	10.2	40	40	46.8	46.8	92	92	74-125	0	30					
Chloromethane	ug/L	<2.2	40	40	33.2	32.8	83	82	58-129	1	30					
cis-1,2-Dichloroethene	ug/L	<0.40	40	40	35.4	36.3	88	91	63-135	3	30					
cis-1,3-Dichloropropene	ug/L	<0.23	40	40	33.1	33.7	83	84	66-129	2	30					
Dibromochloromethane	ug/L	<0.27	40	40	40.8	40.9	102	102	75-133	0	30					

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

Parameter	Units	10414415001		2794626		2794627		% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Dibromomethane	ug/L	<1.0	40	40	37.3	36.8	93	92	68-134	1	30		
Dichlorodifluoromethane	ug/L	<0.63	40	40	45.8	45.4	115	114	72-150	1	30		
Dichlorofluoromethane	ug/L	<0.77	40	40	39.8	38.5	99	96	75-129	3	30		
Diisopropyl ether	ug/L	<0.25	40	40	36.1	36.6	90	91	62-128	1	30		
Ethyl-tert-butyl ether	ug/L	<0.26	40	40	34.9	35.9	87	90	63-132	3	30		
Ethylbenzene	ug/L	<0.27	40	40	39.4	41.6	98	104	72-130	6	30		
Hexachloro-1,3-butadiene	ug/L	<0.96	40	40	42.6	47.7	107	119	71-150	11	30		
Isopropylbenzene (Cumene)	ug/L	<0.28	40	40	38.3	39.5	96	99	70-136	3	30		
m&p-Xylene	ug/L	<0.49	80	80	80.2	84.7	100	106	64-142	5	30		
Methyl-tert-butyl ether	ug/L	<0.29	40	40	36.8	37.9	92	95	72-125	3	30		
Methylene Chloride	ug/L	<2.3	40	40	32.7	33.2	82	83	60-132	1	30		
n-Butylbenzene	ug/L	<0.27	40	40	38.0	40.6	95	101	60-150	7	30		
n-Propylbenzene	ug/L	<0.25	40	40	36.3	38.7	91	97	63-142	6	30		
Naphthalene	ug/L	<0.84	40	40	37.3	39.6	93	99	67-125	6	30		
o-Xylene	ug/L	<0.22	40	40	38.4	39.7	96	99	60-143	3	30		
p-Isopropyltoluene	ug/L	<0.28	40	40	38.2	40.6	96	101	64-146	6	30		
sec-Butylbenzene	ug/L	<0.25	40	40	38.7	40.7	97	102	67-144	5	30		
Styrene	ug/L	<0.29	40	40	37.8	38.9	94	97	67-136	3	30		
tert-Amylmethyl ether	ug/L	<0.23	40	40	37.1	38.0	93	95	60-134	2	30		
tert-Butyl Alcohol	ug/L	<4.4	400	400	421	398	105	100	56-146	6	30		
tert-Butylbenzene	ug/L	<0.29	40	40	38.7	41.1	97	103	68-135	6	30		
Tetrachloroethene	ug/L	<0.32	40	40	39.4	39.5	98	99	67-148	0	30		
Tetrahydrofuran	ug/L	<8.6	400	400	608	644	152	161	51-141	6	30	M1	
Toluene	ug/L	<0.34	40	40	39.4	40.0	98	100	61-140	2	30		
trans-1,2-Dichloroethene	ug/L	<0.42	40	40	38.7	39.5	97	99	62-138	2	30		
trans-1,3-Dichloropropene	ug/L	<0.27	40	40	36.2	38.4	91	96	67-134	6	30		
trans-1,4-Dichloro-2-butene	ug/L	<5.7	100	100	76.9	82.2	77	82	30-150	7	30		
Trichloroethene	ug/L	<0.36	40	40	40.6	41.6	101	104	64-149	2	30		
Trichlorofluoromethane	ug/L	<0.26	40	40	45.7	45.4	114	113	75-150	1	30		
Vinyl acetate	ug/L	<3.0	40	40	33.8	34.9	84	87	49-143	3	30		
Vinyl chloride	ug/L	<0.19	40	40	38.3	38.0	96	95	75-133	1	30		
Xylene (Total)	ug/L	<0.49	120	120	119	124	99	104	63-142	5	30		
1,2-Dichloroethane-d4 (S)	%						98	95	75-137				
4-Bromofluorobenzene (S)	%						95	95	75-125				
Toluene-d8 (S)	%						97	96	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414415

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10414415001	Randall-GW-121217	EPA 8260B	513905		
10414415002	Trip Blank-121217	EPA 8260B	513905		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10414415

Section A: Required Client Information; Section B: Required Project Information; Section C: Invoice Information

Main table with columns: ITEM #, MATRIX CODE, SAMPLE TYPE, COLLECTED (START/END), PRESERVATIVES, ANALYSES TEST, REQUESTED ANALYSIS


Table with columns: ADDITIONAL COMMENTS, RELINQUISHED BY/AFFILIATION, DATE, TIME, ACCEPTED BY/AFFILIATION, DATE, TIME, SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE section with fields for PRINT Name, SIGNATURE, and DATE Signed

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: **UPRR - CH2M Hill** Project #: **0160**

**WO#: 10414415**



10414415

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: **2475 9392 9311 / 7475 9636 3971 / 7448 1033**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer Used:  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **1.0, 3.2, 2.0** Cooler Temp Corrected (°C): **1.1, 3.3, 2.1** Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: **+0.1** Date and Initials of Person Examining Contents: **ME 12/14/17**

USDA Regulated Soil ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  N/A  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  N/A  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>wt</b>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A <input type="checkbox"/> No	15. <b>1 Shared Trip Blank</b>
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>140928</b>		

CLIENT NOTIFICATION/RESOLUTION Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Field Data Required?  Yes  No

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1225</b>	Temp: <b>1.0, 3.2, 2.0</b>	Corrected Temp: <b>1.1, 3.3, 2.1</b>
Time: <b>1240</b>	put in cooler	
Time:	Temp:	Corrected Temp:

**JENNI GROSS**

Date: **12/14/17**  
 rm will be sent to the North Carolina DEHNR Certification Office (i.e. out of

Project Manager Review: \_\_\_\_\_  
 Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers)

December 21, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

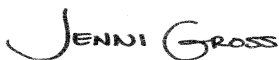
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414592

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 15, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414592001	MW-6s	Water	12/14/17 08:15	12/15/17 09:45
10414592002	MW-12s	Water	12/14/17 09:00	12/15/17 09:45
10414592003	MW-11s	Water	12/14/17 09:20	12/15/17 09:45
10414592004	MW-10s	Water	12/14/17 09:50	12/15/17 09:45
10414592005	MW-7s	Water	12/14/17 10:20	12/15/17 09:45
10414592006	MW-8s	Water	12/14/17 11:20	12/15/17 09:45
10414592007	MW-9s	Water	12/14/17 11:45	12/15/17 09:45
10414592008	MW-21d	Water	12/14/17 13:35	12/15/17 09:45
10414592009	MW-20d	Water	12/14/17 15:00	12/15/17 09:45
10414592010	Trip Blank	Water	12/14/17 00:00	12/15/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414592001	MW-6s	EPA 8260B	DJB	83	PASI-M
10414592002	MW-12s	EPA 8260B	DJB	83	PASI-M
10414592003	MW-11s	EPA 8260B	DJB	83	PASI-M
10414592004	MW-10s	EPA 8260B	DJB	83	PASI-M
10414592005	MW-7s	EPA 8260B	DJB	83	PASI-M
10414592006	MW-8s	EPA 8260B	DJB	83	PASI-M
10414592007	MW-9s	EPA 8260B	DJB	83	PASI-M
10414592008	MW-21d	EPA 8260B	DJB	83	PASI-M
10414592009	MW-20d	EPA 8260B	DJB	83	PASI-M
10414592010	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414592004</b>	<b>MW-10s</b>					
EPA 8260B	Carbon tetrachloride	0.86	ug/L	0.50	12/19/17 03:21	
<b>10414592005</b>	<b>MW-7s</b>					
EPA 8260B	Carbon tetrachloride	1.5	ug/L	0.50	12/19/17 03:44	
<b>10414592006</b>	<b>MW-8s</b>					
EPA 8260B	Carbon disulfide	1.0	ug/L	1.0	12/19/17 17:25	
EPA 8260B	Carbon tetrachloride	222	ug/L	0.50	12/19/17 17:25	
EPA 8260B	Chloroform	46.0	ug/L	1.0	12/19/17 17:25	
<b>10414592007</b>	<b>MW-9s</b>					
EPA 8260B	Carbon disulfide	6.4	ug/L	5.0	12/19/17 08:26	
EPA 8260B	Carbon tetrachloride	541	ug/L	2.5	12/19/17 08:26	
EPA 8260B	Chloroform	65.8	ug/L	5.0	12/19/17 08:26	
<b>10414592009</b>	<b>MW-20d</b>					
EPA 8260B	Carbon tetrachloride	38.2	ug/L	0.50	12/19/17 17:48	
EPA 8260B	Chloroform	0.93J	ug/L	1.0	12/19/17 17:48	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 21, 2017

### General Information:

10 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- MW-10s (Lab ID: 10414592004)
- MW-11s (Lab ID: 10414592003)
- MW-12s (Lab ID: 10414592002)
- MW-20d (Lab ID: 10414592009)
- MW-21d (Lab ID: 10414592008)
- MW-6s (Lab ID: 10414592001)
- MW-7s (Lab ID: 10414592005)
- MW-8s (Lab ID: 10414592006)
- MW-9s (Lab ID: 10414592007)
- Trip Blank (Lab ID: 10414592010)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 514564

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2798300)
  - Tetrahydrofuran

R1: RPD value was outside control limits.

- LCSD (Lab ID: 2798301)

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 21, 2017

QC Batch: 514564

R1: RPD value was outside control limits.

- 1,1-Dichloroethane
- Acrylonitrile
- Diisopropyl ether

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 514230

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 514564

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10414592

Sample: MW-6s Lab ID: 10414592001 Collected: 12/14/17 08:15 Received: 12/15/17 09:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 01:47	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 01:47	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 01:47	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 01:47	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:47	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:47	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 01:47	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:47	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 01:47	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 01:47	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 01:47	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 01:47	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 01:47	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 01:47	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 01:47	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:47	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 01:47	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 01:47	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 01:47	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 01:47	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 01:47	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 01:47	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 01:47	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 01:47	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 01:47	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 01:47	67-64-1	M1
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 01:47	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 01:47	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 01:47	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 01:47	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 01:47	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 01:47	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 01:47	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 01:47	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 01:47	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 01:47	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 01:47	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 01:47	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-6s**      **Lab ID: 10414592001**      Collected: 12/14/17 08:15      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 01:47	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 01:47	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 01:47	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 01:47	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 01:47	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 01:47	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 01:47	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 01:47	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 01:47	109-99-9	M1
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 01:47	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 01:47	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 01:47	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 01:47	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 01:47	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 01:47	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 01:47	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 01:47	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 01:47	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 01:47	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 01:47	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 01:47	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 01:47	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 01:47	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 01:47	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 01:47	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:47	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 01:47	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		12/19/17 01:47	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		12/19/17 01:47	2037-26-5	
4-Bromofluorobenzene (S)	92	%	75-125		1		12/19/17 01:47	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-12s**      **Lab ID: 10414592002**      Collected: 12/14/17 09:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 02:10	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 02:10	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 02:10	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 02:10	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:10	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:10	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 02:10	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:10	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 02:10	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 02:10	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 02:10	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 02:10	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 02:10	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 02:10	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 02:10	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:10	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 02:10	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 02:10	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 02:10	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 02:10	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 02:10	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 02:10	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 02:10	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 02:10	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 02:10	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 02:10	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 02:10	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 02:10	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 02:10	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 02:10	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 02:10	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 02:10	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 02:10	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 02:10	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 02:10	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 02:10	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 02:10	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 02:10	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-12s**      **Lab ID: 10414592002**      Collected: 12/14/17 09:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 02:10	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 02:10	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 02:10	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 02:10	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 02:10	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 02:10	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 02:10	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 02:10	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 02:10	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 02:10	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 02:10	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 02:10	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 02:10	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 02:10	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 02:10	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 02:10	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 02:10	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 02:10	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 02:10	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 02:10	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 02:10	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 02:10	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 02:10	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 02:10	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 02:10	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:10	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 02:10	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		12/19/17 02:10	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		12/19/17 02:10	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		1		12/19/17 02:10	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-11s**      **Lab ID: 10414592003**      Collected: 12/14/17 09:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 02:57	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 02:57	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 02:57	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 02:57	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:57	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:57	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 02:57	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:57	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 02:57	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 02:57	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 02:57	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 02:57	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 02:57	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 02:57	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 02:57	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 02:57	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 02:57	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 02:57	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 02:57	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 02:57	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 02:57	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 02:57	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 02:57	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 02:57	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 02:57	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 02:57	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 02:57	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 02:57	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 02:57	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 02:57	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 02:57	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 02:57	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 02:57	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 02:57	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 02:57	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 02:57	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 02:57	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 02:57	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-11s**      **Lab ID: 10414592003**      Collected: 12/14/17 09:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 02:57	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 02:57	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 02:57	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 02:57	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 02:57	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 02:57	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 02:57	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 02:57	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 02:57	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 02:57	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 02:57	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 02:57	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 02:57	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 02:57	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 02:57	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 02:57	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 02:57	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 02:57	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 02:57	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 02:57	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 02:57	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 02:57	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 02:57	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 02:57	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 02:57	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 02:57	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 02:57	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		12/19/17 02:57	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		12/19/17 02:57	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125		1		12/19/17 02:57	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-10s**      **Lab ID: 10414592004**      Collected: 12/14/17 09:50      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 03:21	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 03:21	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 03:21	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 03:21	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:21	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:21	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 03:21	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:21	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 03:21	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 03:21	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 03:21	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 03:21	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 03:21	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 03:21	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 03:21	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:21	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 03:21	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 03:21	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 03:21	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 03:21	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 03:21	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 03:21	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 03:21	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 03:21	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 03:21	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 03:21	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 03:21	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 03:21	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 03:21	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 03:21	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 03:21	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 03:21	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 03:21	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 03:21	75-15-0	
Carbon tetrachloride	0.86	ug/L	0.50	0.20	1		12/19/17 03:21	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 03:21	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 03:21	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 03:21	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-10s**      **Lab ID: 10414592004**      Collected: 12/14/17 09:50      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 03:21	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 03:21	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 03:21	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 03:21	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 03:21	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 03:21	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 03:21	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 03:21	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 03:21	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 03:21	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 03:21	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 03:21	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 03:21	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 03:21	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 03:21	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 03:21	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 03:21	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 03:21	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 03:21	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 03:21	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 03:21	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 03:21	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 03:21	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 03:21	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 03:21	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:21	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 03:21	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		1		12/19/17 03:21	17060-07-0	
Toluene-d8 (S)	94	%	75-125		1		12/19/17 03:21	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1		12/19/17 03:21	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414592

**Sample: MW-7s**      **Lab ID: 10414592005**      Collected: 12/14/17 10:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 03:44	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 03:44	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 03:44	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 03:44	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:44	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:44	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 03:44	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:44	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 03:44	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 03:44	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 03:44	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 03:44	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 03:44	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 03:44	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 03:44	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 03:44	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 03:44	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 03:44	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 03:44	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 03:44	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 03:44	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 03:44	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 03:44	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 03:44	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 03:44	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 03:44	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 03:44	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 03:44	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 03:44	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 03:44	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 03:44	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 03:44	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 03:44	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 03:44	75-15-0	
Carbon tetrachloride	1.5	ug/L	0.50	0.20	1		12/19/17 03:44	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 03:44	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 03:44	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 03:44	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-7s**      **Lab ID: 10414592005**      Collected: 12/14/17 10:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 03:44	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 03:44	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 03:44	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 03:44	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 03:44	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 03:44	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 03:44	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 03:44	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 03:44	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 03:44	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 03:44	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 03:44	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 03:44	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 03:44	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 03:44	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 03:44	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 03:44	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 03:44	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 03:44	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 03:44	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 03:44	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 03:44	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 03:44	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 03:44	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 03:44	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 03:44	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 03:44	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		12/19/17 03:44	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		12/19/17 03:44	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/19/17 03:44	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-8s**      **Lab ID: 10414592006**      Collected: 12/14/17 11:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 17:25	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 17:25	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 17:25	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 17:25	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	75-34-3	L2
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:25	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:25	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 17:25	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:25	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 17:25	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 17:25	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 17:25	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 17:25	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 17:25	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 17:25	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 17:25	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:25	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 17:25	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 17:25	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 17:25	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 17:25	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 17:25	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 17:25	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 17:25	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 17:25	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 17:25	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 17:25	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 17:25	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 17:25	107-13-1	L2
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 17:25	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 17:25	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 17:25	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 17:25	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 17:25	74-83-9	
Carbon disulfide	1.0	ug/L	1.0	0.37	1		12/19/17 17:25	75-15-0	
Carbon tetrachloride	222	ug/L	0.50	0.20	1		12/19/17 17:25	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 17:25	75-00-3	
Chloroform	46.0	ug/L	1.0	0.46	1		12/19/17 17:25	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 17:25	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-8s**      **Lab ID: 10414592006**      Collected: 12/14/17 11:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 17:25	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 17:25	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 17:25	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 17:25	108-20-3	L2
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	637-92-3	L2
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 17:25	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 17:25	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 17:25	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 17:25	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 17:25	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 17:25	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 17:25	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 17:25	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 17:25	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 17:25	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 17:25	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 17:25	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 17:25	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 17:25	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 17:25	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 17:25	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 17:25	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 17:25	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 17:25	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 17:25	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 17:25	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:25	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 17:25	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	94	%	75-137		1		12/19/17 17:25	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/19/17 17:25	2037-26-5	
4-Bromofluorobenzene (S)	95	%	75-125		1		12/19/17 17:25	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-9s**      **Lab ID: 10414592007**      Collected: 12/14/17 11:45      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.72	ug/L	2.5	0.72	5		12/19/17 08:26	630-20-6	
1,1,1-Trichloroethane	<0.76	ug/L	2.5	0.76	5		12/19/17 08:26	71-55-6	
1,1,2,2-Tetrachloroethane	<0.94	ug/L	2.5	0.94	5		12/19/17 08:26	79-34-5	
1,1,2-Trichloroethane	<1.1	ug/L	2.5	1.1	5		12/19/17 08:26	79-00-5	
1,1,2-Trichlorotrifluoroethane	<1.4	ug/L	5.0	1.4	5		12/19/17 08:26	76-13-1	
1,1-Dichloroethane	<0.72	ug/L	2.5	0.72	5		12/19/17 08:26	75-34-3	
1,1-Dichloroethene	<0.90	ug/L	2.5	0.90	5		12/19/17 08:26	75-35-4	
1,1-Dichloropropene	<0.88	ug/L	2.5	0.88	5		12/19/17 08:26	563-58-6	
1,2,3-Trichlorobenzene	<0.72	ug/L	2.5	0.72	5		12/19/17 08:26	87-61-6	
1,2,3-Trichloropropane	<3.3	ug/L	20.0	3.3	5		12/19/17 08:26	96-18-4	
1,2,4-Trichlorobenzene	<0.89	ug/L	2.5	0.89	5		12/19/17 08:26	120-82-1	
1,2,4-Trimethylbenzene	<0.49	ug/L	2.5	0.49	5		12/19/17 08:26	95-63-6	
1,2-Dibromo-3-chloropropane	<5.2	ug/L	20.0	5.2	5		12/19/17 08:26	96-12-8	
1,2-Dibromoethane (EDB)	<0.86	ug/L	2.5	0.86	5		12/19/17 08:26	106-93-4	
1,2-Dichlorobenzene	<1.0	ug/L	2.5	1.0	5		12/19/17 08:26	95-50-1	
1,2-Dichloroethane	<0.76	ug/L	2.5	0.76	5		12/19/17 08:26	107-06-2	
1,2-Dichloroethene (Total)	<2.1	ug/L	5.0	2.1	5		12/19/17 08:26	540-59-0	
1,2-Dichloropropane	<3.1	ug/L	20.0	3.1	5		12/19/17 08:26	78-87-5	
1,3,5-Trimethylbenzene	<0.90	ug/L	2.5	0.90	5		12/19/17 08:26	108-67-8	
1,3-Dichlorobenzene	<0.80	ug/L	2.5	0.80	5		12/19/17 08:26	541-73-1	
1,3-Dichloropropane	<0.64	ug/L	2.5	0.64	5		12/19/17 08:26	142-28-9	
1,4-Dichlorobenzene	<0.52	ug/L	2.5	0.52	5		12/19/17 08:26	106-46-7	
1,4-Dioxane (p-Dioxane)	<113	ug/L	1000	113	5		12/19/17 08:26	123-91-1	
2,2,4-Trimethylpentane	<6.5	ug/L	20.0	6.5	5		12/19/17 08:26	540-84-1	
2,2-Dichloropropane	<2.0	ug/L	5.0	2.0	5		12/19/17 08:26	594-20-7	
2-Butanone (MEK)	<12.1	ug/L	25.0	12.1	5		12/19/17 08:26	78-93-3	
2-Chlorotoluene	<1.0	ug/L	2.5	1.0	5		12/19/17 08:26	95-49-8	
2-Hexanone	<12.4	ug/L	25.0	12.4	5		12/19/17 08:26	591-78-6	
4-Chlorotoluene	<0.66	ug/L	2.5	0.66	5		12/19/17 08:26	106-43-4	
4-Methyl-2-pentanone (MIBK)	<2.7	ug/L	25.0	2.7	5		12/19/17 08:26	108-10-1	
Acetone	<44.2	ug/L	100	44.2	5		12/19/17 08:26	67-64-1	
Acrolein	<24.2	ug/L	50.0	24.2	5		12/19/17 08:26	107-02-8	
Acrylonitrile	<24.4	ug/L	50.0	24.4	5		12/19/17 08:26	107-13-1	
Benzene	<0.63	ug/L	2.5	0.63	5		12/19/17 08:26	71-43-2	
Bromobenzene	<0.78	ug/L	2.5	0.78	5		12/19/17 08:26	108-86-1	
Bromochloromethane	<1.9	ug/L	5.0	1.9	5		12/19/17 08:26	74-97-5	
Bromodichloromethane	<1.0	ug/L	2.5	1.0	5		12/19/17 08:26	75-27-4	
Bromoform	<5.2	ug/L	20.0	5.2	5		12/19/17 08:26	75-25-2	
Bromomethane	<7.7	ug/L	20.0	7.7	5		12/19/17 08:26	74-83-9	
Carbon disulfide	6.4	ug/L	5.0	1.9	5		12/19/17 08:26	75-15-0	
Carbon tetrachloride	541	ug/L	2.5	1.0	5		12/19/17 08:26	56-23-5	
Chlorobenzene	<0.68	ug/L	2.5	0.68	5		12/19/17 08:26	108-90-7	
Chloroethane	<2.2	ug/L	5.0	2.2	5		12/19/17 08:26	75-00-3	
Chloroform	65.8	ug/L	5.0	2.3	5		12/19/17 08:26	67-66-3	
Chloromethane	<5.4	ug/L	20.0	5.4	5		12/19/17 08:26	74-87-3	
Dibromochloromethane	<0.67	ug/L	2.5	0.67	5		12/19/17 08:26	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-9s**      **Lab ID: 10414592007**      Collected: 12/14/17 11:45      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<2.5	ug/L	5.0	2.5	5		12/19/17 08:26	74-95-3	
Dichlorodifluoromethane	<1.6	ug/L	5.0	1.6	5		12/19/17 08:26	75-71-8	
Dichlorofluoromethane	<1.9	ug/L	5.0	1.9	5		12/19/17 08:26	75-43-4	
Diisopropyl ether	<0.62	ug/L	5.0	0.62	5		12/19/17 08:26	108-20-3	
Ethyl-tert-butyl ether	<0.64	ug/L	2.5	0.64	5		12/19/17 08:26	637-92-3	
Ethylbenzene	<0.68	ug/L	2.5	0.68	5		12/19/17 08:26	100-41-4	
Hexachloro-1,3-butadiene	<2.4	ug/L	5.0	2.4	5		12/19/17 08:26	87-68-3	
Isopropylbenzene (Cumene)	<0.70	ug/L	2.5	0.70	5		12/19/17 08:26	98-82-8	
Methyl-tert-butyl ether	<0.72	ug/L	2.5	0.72	5		12/19/17 08:26	1634-04-4	
Methylene Chloride	<5.8	ug/L	20.0	5.8	5		12/19/17 08:26	75-09-2	
Naphthalene	<2.1	ug/L	5.0	2.1	5		12/19/17 08:26	91-20-3	
Styrene	<0.72	ug/L	2.5	0.72	5		12/19/17 08:26	100-42-5	
Tetrachloroethene	<0.79	ug/L	2.5	0.79	5		12/19/17 08:26	127-18-4	
Tetrahydrofuran	<21.6	ug/L	50.0	21.6	5		12/19/17 08:26	109-99-9	
Toluene	<0.86	ug/L	2.5	0.86	5		12/19/17 08:26	108-88-3	
Trichloroethene	<0.91	ug/L	2.0	0.91	5		12/19/17 08:26	79-01-6	
Trichlorofluoromethane	<0.64	ug/L	2.5	0.64	5		12/19/17 08:26	75-69-4	
Vinyl acetate	<7.4	ug/L	50.0	7.4	5		12/19/17 08:26	108-05-4	L2
Vinyl chloride	<0.48	ug/L	1.0	0.48	5		12/19/17 08:26	75-01-4	
Xylene (Total)	<1.2	ug/L	7.5	1.2	5		12/19/17 08:26	1330-20-7	
cis-1,2-Dichloroethene	<1.0	ug/L	2.5	1.0	5		12/19/17 08:26	156-59-2	
cis-1,3-Dichloropropene	<0.58	ug/L	2.5	0.58	5		12/19/17 08:26	10061-01-5	
m&p-Xylene	<1.2	ug/L	5.0	1.2	5		12/19/17 08:26	179601-23-1	
n-Butylbenzene	<0.66	ug/L	2.5	0.66	5		12/19/17 08:26	104-51-8	
n-Propylbenzene	<0.62	ug/L	2.5	0.62	5		12/19/17 08:26	103-65-1	
o-Xylene	<0.54	ug/L	2.5	0.54	5		12/19/17 08:26	95-47-6	
p-Isopropyltoluene	<0.70	ug/L	2.5	0.70	5		12/19/17 08:26	99-87-6	
sec-Butylbenzene	<0.62	ug/L	2.5	0.62	5		12/19/17 08:26	135-98-8	
tert-Amylmethyl ether	<0.58	ug/L	2.5	0.58	5		12/19/17 08:26	994-05-8	
tert-Butyl Alcohol	<11.0	ug/L	50.0	11.0	5		12/19/17 08:26	75-65-0	
tert-Butylbenzene	<0.74	ug/L	2.5	0.74	5		12/19/17 08:26	98-06-6	
trans-1,2-Dichloroethene	<1.0	ug/L	2.5	1.0	5		12/19/17 08:26	156-60-5	
trans-1,3-Dichloropropene	<0.68	ug/L	2.5	0.68	5		12/19/17 08:26	10061-02-6	
trans-1,4-Dichloro-2-butene	<14.2	ug/L	50.0	14.2	5		12/19/17 08:26	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	92	%	75-137		5		12/19/17 08:26	17060-07-0	
Toluene-d8 (S)	96	%	75-125		5		12/19/17 08:26	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		5		12/19/17 08:26	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414592

**Sample: MW-21d**      **Lab ID: 10414592008**      Collected: 12/14/17 13:35      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 04:08	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 04:08	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 04:08	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 04:08	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:08	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:08	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 04:08	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:08	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 04:08	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 04:08	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 04:08	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 04:08	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 04:08	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 04:08	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 04:08	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:08	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:08	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 04:08	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 04:08	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 04:08	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 04:08	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 04:08	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 04:08	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 04:08	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 04:08	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 04:08	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 04:08	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 04:08	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:08	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 04:08	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 04:08	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 04:08	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 04:08	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 04:08	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 04:08	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 04:08	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 04:08	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 04:08	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-21d**      **Lab ID: 10414592008**      Collected: 12/14/17 13:35      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 04:08	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 04:08	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 04:08	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 04:08	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 04:08	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 04:08	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 04:08	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:08	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 04:08	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 04:08	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 04:08	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 04:08	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 04:08	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 04:08	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 04:08	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:08	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 04:08	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:08	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:08	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 04:08	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:08	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 04:08	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 04:08	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 04:08	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 04:08	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:08	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 04:08	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		12/19/17 04:08	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/19/17 04:08	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		12/19/17 04:08	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10414592

**Sample: MW-20d**      **Lab ID: 10414592009**      Collected: 12/14/17 15:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 17:48	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 17:48	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 17:48	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 17:48	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	75-34-3	L2
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:48	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:48	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 17:48	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:48	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 17:48	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 17:48	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 17:48	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 17:48	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 17:48	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 17:48	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 17:48	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 17:48	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 17:48	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 17:48	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 17:48	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 17:48	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 17:48	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 17:48	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 17:48	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 17:48	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 17:48	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 17:48	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 17:48	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 17:48	107-13-1	L2
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 17:48	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 17:48	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 17:48	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 17:48	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 17:48	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 17:48	75-15-0	
Carbon tetrachloride	38.2	ug/L	0.50	0.20	1		12/19/17 17:48	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 17:48	75-00-3	
Chloroform	0.93J	ug/L	1.0	0.46	1		12/19/17 17:48	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 17:48	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: MW-20d**      **Lab ID: 10414592009**      Collected: 12/14/17 15:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b> Analytical Method: EPA 8260B									
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 17:48	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 17:48	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 17:48	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 17:48	108-20-3	L2
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	637-92-3	L2
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 17:48	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 17:48	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 17:48	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 17:48	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 17:48	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 17:48	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 17:48	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 17:48	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 17:48	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 17:48	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 17:48	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 17:48	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 17:48	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 17:48	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 17:48	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 17:48	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 17:48	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 17:48	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 17:48	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 17:48	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 17:48	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 17:48	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 17:48	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		12/19/17 17:48	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/19/17 17:48	2037-26-5	
4-Bromofluorobenzene (S)	92	%	75-125		1		12/19/17 17:48	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: Trip Blank**      **Lab ID: 10414592010**      Collected: 12/14/17 00:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 01:00	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 01:00	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 01:00	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 01:00	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:00	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:00	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 01:00	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:00	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 01:00	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 01:00	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 01:00	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 01:00	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 01:00	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 01:00	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 01:00	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 01:00	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 01:00	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 01:00	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 01:00	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 01:00	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 01:00	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 01:00	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 01:00	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 01:00	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 01:00	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 01:00	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 01:00	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 01:00	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 01:00	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 01:00	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 01:00	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 01:00	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 01:00	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 01:00	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 01:00	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 01:00	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 01:00	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 01:00	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

**Sample: Trip Blank**      **Lab ID: 10414592010**      Collected: 12/14/17 00:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 01:00	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 01:00	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 01:00	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 01:00	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 01:00	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 01:00	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 01:00	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 01:00	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 01:00	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 01:00	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 01:00	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 01:00	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 01:00	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 01:00	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 01:00	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 01:00	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 01:00	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 01:00	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 01:00	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 01:00	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 01:00	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 01:00	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 01:00	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 01:00	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 01:00	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 01:00	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 01:00	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	101	%	75-137		1		12/19/17 01:00	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/19/17 01:00	2037-26-5	
4-Bromofluorobenzene (S)	90	%	75-125		1		12/19/17 01:00	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

QC Batch: 514230 Analysis Method: EPA 8260B  
 QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
 Associated Lab Samples: 10414592001, 10414592002, 10414592003, 10414592004, 10414592005, 10414592007, 10414592008, 10414592010

METHOD BLANK: 2796443 Matrix: Water  
 Associated Lab Samples: 10414592001, 10414592002, 10414592003, 10414592004, 10414592005, 10414592007, 10414592008, 10414592010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/19/17 00:13	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/19/17 00:13	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/19/17 00:13	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/19/17 00:13	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/19/17 00:13	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/19/17 00:13	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/19/17 00:13	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/19/17 00:13	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/19/17 00:13	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/19/17 00:13	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/19/17 00:13	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/19/17 00:13	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/19/17 00:13	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/19/17 00:13	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/19/17 00:13	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/19/17 00:13	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/19/17 00:13	
Acetone	ug/L	<8.8	20.0	8.8	12/19/17 00:13	
Acrolein	ug/L	<4.8	10.0	4.8	12/19/17 00:13	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/19/17 00:13	
Benzene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/19/17 00:13	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
Bromoform	ug/L	<1.0	4.0	1.0	12/19/17 00:13	
Bromomethane	ug/L	<1.5	4.0	1.5	12/19/17 00:13	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/19/17 00:13	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Project No.: 10414592

METHOD BLANK: 2796443

Matrix: Water

Associated Lab Samples: 10414592001, 10414592002, 10414592003, 10414592004, 10414592005, 10414592007, 10414592008, 10414592010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Chloroethane	ug/L	<0.44	1.0	0.44	12/19/17 00:13	
Chloroform	ug/L	<0.46	1.0	0.46	12/19/17 00:13	
Chloromethane	ug/L	<1.1	4.0	1.1	12/19/17 00:13	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/19/17 00:13	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/19/17 00:13	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/19/17 00:13	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/19/17 00:13	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/19/17 00:13	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/19/17 00:13	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/19/17 00:13	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Naphthalene	ug/L	<0.42	1.0	0.42	12/19/17 00:13	
o-Xylene	ug/L	<0.11	0.50	0.11	12/19/17 00:13	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Styrene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/19/17 00:13	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/19/17 00:13	
Toluene	ug/L	<0.17	0.50	0.17	12/19/17 00:13	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/19/17 00:13	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/19/17 00:13	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/19/17 00:13	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/19/17 00:13	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/19/17 00:13	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/19/17 00:13	
1,2-Dichloroethane-d4 (S)	%	96	75-137		12/19/17 00:13	
4-Bromofluorobenzene (S)	%	94	75-125		12/19/17 00:13	
Toluene-d8 (S)	%	95	75-125		12/19/17 00:13	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

LABORATORY CONTROL SAMPLE & LCSD: 2796444

2796445

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	22.1	21.8	111	109	75-136	2	30	
1,1,1-Trichloroethane	ug/L	20	23.5	21.1	117	106	75-129	11	30	
1,1,2,2-Tetrachloroethane	ug/L	20	16.6	17.4	83	87	71-138	5	30	
1,1,2-Trichloroethane	ug/L	20	19.2	18.9	96	95	75-125	1	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.1	18.7	101	94	69-126	7	30	
1,1-Dichloroethane	ug/L	20	18.3	17.9	91	89	75-125	2	30	
1,1-Dichloroethene	ug/L	20	19.9	18.7	99	94	75-125	6	30	
1,1-Dichloropropene	ug/L	20	20.8	18.3	104	92	75-125	13	30	
1,2,3-Trichlorobenzene	ug/L	20	18.3	21.6	91	108	75-125	17	30	
1,2,3-Trichloropropane	ug/L	20	20.6	20.9	103	104	75-125	1	30	
1,2,4-Trichlorobenzene	ug/L	20	18.7	19.8	94	99	75-125	6	30	
1,2,4-Trimethylbenzene	ug/L	20	19.3	19.3	96	97	75-125	0	30	
1,2-Dibromo-3-chloropropane	ug/L	50	49.0	52.8	98	106	71-130	7	30	
1,2-Dibromoethane (EDB)	ug/L	20	19.0	19.4	95	97	75-125	2	30	
1,2-Dichlorobenzene	ug/L	20	20.3	20.9	101	105	75-125	3	30	
1,2-Dichloroethane	ug/L	20	17.7	20.1	88	101	70-125	13	30	
1,2-Dichloroethene (Total)	ug/L	40	39.1	34.7	98	87	75-125	12	30	
1,2-Dichloropropane	ug/L	20	17.0	17.9	85	90	75-125	6	30	
1,3,5-Trimethylbenzene	ug/L	20	19.4	19.9	97	100	75-125	2	30	
1,3-Dichlorobenzene	ug/L	20	20.8	21.2	104	106	75-125	2	30	
1,3-Dichloropropane	ug/L	20	19.3	18.8	97	94	75-125	2	30	
1,4-Dichlorobenzene	ug/L	20	20.9	21.4	105	107	75-125	2	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	394	403	98	101	64-140	2	30	
2,2,4-Trimethylpentane	ug/L	20	17.5	13.7	88	69	68-125	24	30	
2,2-Dichloropropane	ug/L	20	21.1	18.6	105	93	70-131	12	30	
2-Butanone (MEK)	ug/L	100	100	81.2	100	81	69-125	21	30	
2-Chlorotoluene	ug/L	20	19.7	20.2	98	101	75-125	3	30	
2-Hexanone	ug/L	100	94.2	94.1	94	94	73-129	0	30	
4-Chlorotoluene	ug/L	20	18.3	19.1	92	95	75-125	4	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.9	95.3	99	95	73-125	4	30	
Acetone	ug/L	100	106	104	106	104	66-126	2	30	
Acrolein	ug/L	200	168	183	84	92	56-150	9	30	
Acrylonitrile	ug/L	200	135	178	68	89	68-129	27	30	
Benzene	ug/L	20	19.0	18.0	95	90	75-125	5	30	
Bromobenzene	ug/L	20	20.7	21.7	103	108	75-125	5	30	
Bromochloromethane	ug/L	20	20.5	20.5	103	102	75-126	0	30	
Bromodichloromethane	ug/L	20	20.1	19.1	101	96	75-133	5	30	
Bromoform	ug/L	20	20.6	20.7	103	103	62-142	1	30	
Bromomethane	ug/L	20	22.1	24.1	111	120	34-143	8	30	
Carbon disulfide	ug/L	20	19.3	17.5	96	88	71-125	9	30	
Carbon tetrachloride	ug/L	20	23.8	22.1	119	111	71-145	7	30	
Chlorobenzene	ug/L	20	21.1	20.7	106	104	75-125	2	30	
Chloroethane	ug/L	20	20.1	19.5	100	97	75-125	3	30	
Chloroform	ug/L	20	20.6	18.8	103	94	75-125	9	30	
Chloromethane	ug/L	20	19.0	17.8	95	89	54-125	6	30	
cis-1,2-Dichloroethene	ug/L	20	19.4	16.9	97	84	75-125	14	30	
cis-1,3-Dichloropropene	ug/L	20	19.6	19.0	98	95	75-125	3	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

LABORATORY CONTROL SAMPLE & LCSD: 2796444		2796445								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	22.0	22.0	110	110	74-141	0	30	
Dibromomethane	ug/L	20	22.2	21.2	111	106	75-125	5	30	
Dichlorodifluoromethane	ug/L	20	21.0	20.1	105	100	59-130	5	30	
Dichlorofluoromethane	ug/L	20	20.7	19.4	104	97	75-125	6	30	
Diisopropyl ether	ug/L	20	17.1	17.2	86	86	69-125	0	30	
Ethyl-tert-butyl ether	ug/L	20	15.1	17.9	76	90	73-125	17	30	
Ethylbenzene	ug/L	20	20.9	20.7	105	103	75-125	1	30	
Hexachloro-1,3-butadiene	ug/L	20	20.2	21.4	101	107	75-131	6	30	
Isopropylbenzene (Cumene)	ug/L	20	20.3	19.8	102	99	75-125	3	30	
m&p-Xylene	ug/L	40	43.5	42.8	109	107	75-125	2	30	
Methyl-tert-butyl ether	ug/L	20	19.6	19.3	98	97	75-125	1	30	
Methylene Chloride	ug/L	20	15.1	16.5	75	83	73-125	9	30	
n-Butylbenzene	ug/L	20	18.5	18.7	93	93	75-125	1	30	
n-Propylbenzene	ug/L	20	18.5	18.7	92	94	75-125	1	30	
Naphthalene	ug/L	20	16.8	19.5	84	97	74-125	14	30	
o-Xylene	ug/L	20	20.1	20.4	101	102	75-125	1	30	
p-Isopropyltoluene	ug/L	20	19.7	19.2	98	96	75-125	2	30	
sec-Butylbenzene	ug/L	20	19.2	19.7	96	99	75-125	3	30	
Styrene	ug/L	20	20.0	20.0	100	100	75-125	0	30	
tert-Amylmethyl ether	ug/L	20	19.3	18.9	97	94	71-126	2	30	
tert-Butyl Alcohol	ug/L	200	227	214	113	107	69-131	6	30	
tert-Butylbenzene	ug/L	20	19.2	20.1	96	101	75-125	4	30	
Tetrachloroethene	ug/L	20	20.7	20.3	103	101	75-125	2	30	
Tetrahydrofuran	ug/L	200	249	204	125	102	65-127	20	30	
Toluene	ug/L	20	18.0	19.9	90	100	75-125	10	30	
trans-1,2-Dichloroethene	ug/L	20	19.6	17.8	98	89	75-125	10	30	
trans-1,3-Dichloropropene	ug/L	20	19.9	19.6	100	98	75-125	2	30	
trans-1,4-Dichloro-2-butene	ug/L	50	45.3	46.2	91	92	30-150	2	30	
Trichloroethene	ug/L	20	22.2	21.4	111	107	75-125	4	30	
Trichlorofluoromethane	ug/L	20	22.8	21.1	114	105	71-140	8	30	
Vinyl acetate	ug/L	20	12.7	16.0	64	80	68-137	22	30 L2	
Vinyl chloride	ug/L	20	18.7	17.5	93	88	70-125	6	30	
Xylene (Total)	ug/L	60	63.6	63.2	106	105	75-125	1	30	
1,2-Dichloroethane-d4 (S)	%				99	96	75-137			
4-Bromofluorobenzene (S)	%				90	94	75-125			
Toluene-d8 (S)	%				86	97	75-125			

MATRIX SPIKE SAMPLE: 2796446		10414592001						
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	21.6	108	75-137		
1,1,1-Trichloroethane	ug/L	<0.15	20	22.5	113	75-139		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	16.8	84	60-142		
1,1,2-Trichloroethane	ug/L	<0.22	20	18.8	94	75-128		
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	21.0	105	62-150		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

MATRIX SPIKE SAMPLE: 2796446		10414592001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	16.5	82	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	20.4	102	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	20.0	100	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20.6	103	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	20.4	102	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	19.6	98	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	18.5	92	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	48.6	97	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	18.9	95	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	19.9	100	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	20.7	104	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	38.2	95	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	20.4	102	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	19.0	95	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	20.2	101	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	19.0	95	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	20.1	100	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	366	92	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	19.3	97	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	20.3	102	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	94.1	94	58-125	
2-Chlorotoluene	ug/L	<0.20	20	19.5	97	65-138	
2-Hexanone	ug/L	<2.5	100	94.1	94	61-134	
4-Chlorotoluene	ug/L	<0.13	20	18.1	90	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	96.7	97	61-130	
Acetone	ug/L	<8.8	100	165	165	51-140 M1	
Acrolein	ug/L	<4.8	200	189	95	48-150	
Acrylonitrile	ug/L	<4.9	200	150	75	55-134	
Benzene	ug/L	<0.13	20	20.2	101	63-132	
Bromobenzene	ug/L	<0.16	20	20.4	102	67-138	
Bromochloromethane	ug/L	<0.38	20	20.5	102	66-138	
Bromodichloromethane	ug/L	<0.20	20	21.0	105	75-137	
Bromoform	ug/L	<1.0	20	20.2	101	65-129	
Bromomethane	ug/L	<1.5	20	25.5	127	41-150	
Carbon disulfide	ug/L	<0.37	20	19.0	95	72-132	
Carbon tetrachloride	ug/L	<0.20	20	23.4	117	75-150	
Chlorobenzene	ug/L	<0.14	20	20.5	103	73-127	
Chloroethane	ug/L	<0.44	20	20.6	103	74-138	
Chloroform	ug/L	<0.46	20	19.9	100	74-125	
Chloromethane	ug/L	<1.1	20	19.0	95	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	17.5	87	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	19.3	97	66-129	
Dibromochloromethane	ug/L	<0.13	20	21.5	108	75-133	
Dibromomethane	ug/L	<0.50	20	23.2	116	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	23.5	117	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.9	104	75-129	
Diisopropyl ether	ug/L	<0.12	20	14.5	73	62-128	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

MATRIX SPIKE SAMPLE: 2796446

Parameter	Units	10414592001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	16.5	83	63-132	
Ethylbenzene	ug/L	<0.14	20	20.4	102	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	19.9	99	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	19.9	100	70-136	
m&p-Xylene	ug/L	<0.24	40	42.6	107	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	17.1	86	72-125	
Methylene Chloride	ug/L	<1.2	20	15.8	79	60-132	
n-Butylbenzene	ug/L	<0.13	20	17.8	89	60-150	
n-Propylbenzene	ug/L	<0.12	20	18.2	91	63-142	
Naphthalene	ug/L	<0.42	20	18.6	93	67-125	
o-Xylene	ug/L	<0.11	20	19.9	100	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	19.0	95	64-146	
sec-Butylbenzene	ug/L	<0.12	20	18.6	93	67-144	
Styrene	ug/L	<0.14	20	19.4	97	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	19.5	98	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	181	90	56-146	
tert-Butylbenzene	ug/L	<0.15	20	19.1	95	68-135	
Tetrachloroethene	ug/L	<0.16	20	20.2	101	67-148	
Tetrahydrofuran	ug/L	<4.3	200	358	179	51-141 M1	
Toluene	ug/L	<0.17	20	19.7	99	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20.7	104	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	18.6	93	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	43.9	88	30-150	
Trichloroethene	ug/L	<0.18	20	21.5	108	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	24.4	122	75-150	
Vinyl acetate	ug/L	<1.5	20	14.6	73	49-143	
Vinyl chloride	ug/L	<0.096	20	19.5	97	75-133	
Xylene (Total)	ug/L	<0.24	60	62.5	104	63-142	
1,2-Dichloroethane-d4 (S)	%					95	75-137
4-Bromofluorobenzene (S)	%					92	75-125
Toluene-d8 (S)	%					93	75-125

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	99	100	1		
4-Bromofluorobenzene (S)	%	93	94	0		
Toluene-d8 (S)	%	97	96	0		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

QC Batch: 514564 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10414592006, 10414592009

METHOD BLANK: 2798299 Matrix: Water

Associated Lab Samples: 10414592006, 10414592009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 12:43	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/19/17 12:43	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/19/17 12:43	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/19/17 12:43	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/19/17 12:43	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/19/17 12:43	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/19/17 12:43	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/19/17 12:43	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/19/17 12:43	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/19/17 12:43	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/19/17 12:43	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/19/17 12:43	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 12:43	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/19/17 12:43	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/19/17 12:43	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/19/17 12:43	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/19/17 12:43	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/19/17 12:43	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/19/17 12:43	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/19/17 12:43	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/19/17 12:43	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/19/17 12:43	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/19/17 12:43	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/19/17 12:43	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/19/17 12:43	
Acetone	ug/L	<8.8	20.0	8.8	12/19/17 12:43	
Acrolein	ug/L	<4.8	10.0	4.8	12/19/17 12:43	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/19/17 12:43	
Benzene	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/19/17 12:43	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/19/17 12:43	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/19/17 12:43	
Bromoform	ug/L	<1.0	4.0	1.0	12/19/17 12:43	
Bromomethane	ug/L	<1.5	4.0	1.5	12/19/17 12:43	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/19/17 12:43	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/19/17 12:43	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

METHOD BLANK: 2798299

Matrix: Water

Associated Lab Samples: 10414592006, 10414592009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
Chloroethane	ug/L	<0.44	1.0	0.44	12/19/17 12:43	
Chloroform	ug/L	<0.46	1.0	0.46	12/19/17 12:43	
Chloromethane	ug/L	<1.1	4.0	1.1	12/19/17 12:43	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/19/17 12:43	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/19/17 12:43	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/19/17 12:43	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/19/17 12:43	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/19/17 12:43	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/19/17 12:43	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/19/17 12:43	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/19/17 12:43	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/19/17 12:43	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 12:43	
Naphthalene	ug/L	<0.42	1.0	0.42	12/19/17 12:43	
o-Xylene	ug/L	<0.11	0.50	0.11	12/19/17 12:43	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 12:43	
Styrene	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/19/17 12:43	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/19/17 12:43	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/19/17 12:43	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/19/17 12:43	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/19/17 12:43	
Toluene	ug/L	<0.17	0.50	0.17	12/19/17 12:43	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/19/17 12:43	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/19/17 12:43	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/19/17 12:43	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/19/17 12:43	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/19/17 12:43	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/19/17 12:43	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/19/17 12:43	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/19/17 12:43	
1,2-Dichloroethane-d4 (S)	%	97	75-137		12/19/17 12:43	
4-Bromofluorobenzene (S)	%	91	75-125		12/19/17 12:43	
Toluene-d8 (S)	%	95	75-125		12/19/17 12:43	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

LABORATORY CONTROL SAMPLE & LCSD: 2798300

2798301

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	21.2	21.6	106	108	75-136	2	30	
1,1,1-Trichloroethane	ug/L	20	24.1	19.0	121	95	75-129	24	30	
1,1,2,2-Tetrachloroethane	ug/L	20	17.1	17.7	86	88	71-138	3	30	
1,1,2-Trichloroethane	ug/L	20	16.7	19.7	83	98	75-125	16	30	
1,1,2-Trichlorotrifluoroethane	ug/L	20	18.0	16.4	90	82	69-126	10	30	
1,1-Dichloroethane	ug/L	20	19.5	14.1	98	71	75-125	32	30	L2,R1
1,1-Dichloroethene	ug/L	20	18.9	17.2	95	86	75-125	10	30	
1,1-Dichloropropene	ug/L	20	20.8	17.7	104	88	75-125	17	30	
1,2,3-Trichlorobenzene	ug/L	20	19.6	22.1	98	110	75-125	12	30	
1,2,3-Trichloropropane	ug/L	20	21.4	20.2	107	101	75-125	6	30	
1,2,4-Trichlorobenzene	ug/L	20	20.4	20.2	102	101	75-125	1	30	
1,2,4-Trimethylbenzene	ug/L	20	19.9	19.7	100	99	75-125	1	30	
1,2-Dibromo-3-chloropropane	ug/L	50	50.5	50.5	101	101	71-130	0	30	
1,2-Dibromoethane (EDB)	ug/L	20	17.1	19.1	86	95	75-125	11	30	
1,2-Dichlorobenzene	ug/L	20	21.2	21.0	106	105	75-125	1	30	
1,2-Dichloroethane	ug/L	20	21.6	20.1	108	100	70-125	7	30	
1,2-Dichloroethene (Total)	ug/L	40	39.4	32.4	99	81	75-125	19	30	
1,2-Dichloropropane	ug/L	20	17.7	18.3	89	91	75-125	3	30	
1,3,5-Trimethylbenzene	ug/L	20	19.8	19.7	99	98	75-125	1	30	
1,3-Dichlorobenzene	ug/L	20	21.8	21.3	109	106	75-125	3	30	
1,3-Dichloropropane	ug/L	20	17.1	19.3	86	96	75-125	12	30	
1,4-Dichlorobenzene	ug/L	20	21.7	21.4	108	107	75-125	1	30	
1,4-Dioxane (p-Dioxane)	ug/L	400	377	388	94	97	64-140	3	30	
2,2,4-Trimethylpentane	ug/L	20	17.7	16.6	89	83	68-125	6	30	
2,2-Dichloropropane	ug/L	20	22.4	17.5	112	88	70-131	24	30	
2-Butanone (MEK)	ug/L	100	99.1	84.3	99	84	69-125	16	30	
2-Chlorotoluene	ug/L	20	20.6	19.5	103	97	75-125	6	30	
2-Hexanone	ug/L	100	91.4	94.1	91	94	73-129	3	30	
4-Chlorotoluene	ug/L	20	19.4	18.9	97	95	75-125	2	30	
4-Methyl-2-pentanone (MIBK)	ug/L	100	79.7	96.6	80	97	73-125	19	30	
Acetone	ug/L	100	113	103	113	103	66-126	9	30	
Acrolein	ug/L	200	181	173	91	86	56-150	5	30	
Acrylonitrile	ug/L	200	180	126	90	63	68-129	35	30	L2,R1
Benzene	ug/L	20	20.0	18.5	100	92	75-125	8	30	
Bromobenzene	ug/L	20	22.3	21.5	112	107	75-125	4	30	
Bromochloromethane	ug/L	20	22.5	17.0	112	85	75-126	28	30	
Bromodichloromethane	ug/L	20	20.3	19.7	101	99	75-133	3	30	
Bromoform	ug/L	20	20.9	21.1	104	106	62-142	1	30	
Bromomethane	ug/L	20	16.6	17.1	83	85	34-143	3	30	
Carbon disulfide	ug/L	20	16.6	15.8	83	79	71-125	4	30	
Carbon tetrachloride	ug/L	20	24.9	19.2	125	96	71-145	26	30	
Chlorobenzene	ug/L	20	20.6	20.5	103	103	75-125	0	30	
Chloroethane	ug/L	20	22.5	19.0	113	95	75-125	17	30	
Chloroform	ug/L	20	21.9	16.5	110	83	75-125	28	30	
Chloromethane	ug/L	20	17.1	14.4	85	72	54-125	17	30	
cis-1,2-Dichloroethene	ug/L	20	19.2	15.0	96	75	75-125	24	30	
cis-1,3-Dichloropropene	ug/L	20	19.5	19.6	98	98	75-125	0	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

LABORATORY CONTROL SAMPLE & LCSD: 2798300		2798301									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	20.1	22.3	101	112	74-141	10	30		
Dibromomethane	ug/L	20	23.2	21.6	116	108	75-125	7	30		
Dichlorodifluoromethane	ug/L	20	22.6	18.8	113	94	59-130	18	30		
Dichlorofluoromethane	ug/L	20	21.7	17.9	109	89	75-125	20	30		
Diisopropyl ether	ug/L	20	17.7	12.2	89	61	69-125	37	30	L2,R1	
Ethyl-tert-butyl ether	ug/L	20	19.1	14.3	95	72	73-125	29	30	L2	
Ethylbenzene	ug/L	20	20.4	20.4	102	102	75-125	0	30		
Hexachloro-1,3-butadiene	ug/L	20	22.0	21.5	110	108	75-131	2	30		
Isopropylbenzene (Cumene)	ug/L	20	19.7	19.8	98	99	75-125	0	30		
m&p-Xylene	ug/L	40	43.3	42.2	108	105	75-125	3	30		
Methyl-tert-butyl ether	ug/L	20	20.2	18.4	101	92	75-125	9	30		
Methylene Chloride	ug/L	20	16.7	16.3	83	82	73-125	2	30		
n-Butylbenzene	ug/L	20	20.1	18.5	100	92	75-125	8	30		
n-Propylbenzene	ug/L	20	19.3	18.5	96	93	75-125	4	30		
Naphthalene	ug/L	20	17.9	20.1	89	101	74-125	12	30		
o-Xylene	ug/L	20	20.2	20.1	101	101	75-125	0	30		
p-Isopropyltoluene	ug/L	20	20.6	19.8	103	99	75-125	4	30		
sec-Butylbenzene	ug/L	20	20.0	19.2	100	96	75-125	4	30		
Styrene	ug/L	20	20.1	19.8	101	99	75-125	1	30		
tert-Amylmethyl ether	ug/L	20	19.3	19.7	97	98	71-126	2	30		
tert-Butyl Alcohol	ug/L	200	244	187	122	94	69-131	26	30		
tert-Butylbenzene	ug/L	20	20.4	19.6	102	98	75-125	4	30		
Tetrachloroethene	ug/L	20	19.2	20.1	96	100	75-125	5	30		
Tetrahydrofuran	ug/L	200	268	200	134	100	65-127	29	30	L3	
Toluene	ug/L	20	17.7	20.1	89	100	75-125	13	30		
trans-1,2-Dichloroethene	ug/L	20	20.2	17.4	101	87	75-125	15	30		
trans-1,3-Dichloropropene	ug/L	20	17.4	19.9	87	100	75-125	13	30		
trans-1,4-Dichloro-2-butene	ug/L	50	46.0	46.6	92	93	30-150	1	30		
Trichloroethene	ug/L	20	22.3	20.9	112	104	75-125	7	30		
Trichlorofluoromethane	ug/L	20	23.9	20.1	119	100	71-140	17	30		
Vinyl acetate	ug/L	20	17.7	13.7	89	68	68-137	26	30		
Vinyl chloride	ug/L	20	19.0	16.3	95	81	70-125	15	30		
Xylene (Total)	ug/L	60	63.5	62.3	106	104	75-125	2	30		
1,2-Dichloroethane-d4 (S)	%				95	94	75-137				
4-Bromofluorobenzene (S)	%				95	95	75-125				
Toluene-d8 (S)	%				82	97	75-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414592

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.  
ND - Not Detected at or above adjusted reporting limit.  
TNTC - Too Numerous To Count  
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.  
MDL - Adjusted Method Detection Limit.  
PQL - Practical Quantitation Limit.  
RL - Reporting Limit.  
S - Surrogate  
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.  
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.  
LCS(D) - Laboratory Control Sample (Duplicate)  
MS(D) - Matrix Spike (Duplicate)  
DUP - Sample Duplicate  
RPD - Relative Percent Difference  
NC - Not Calculable.  
SG - Silica Gel - Clean-Up  
U - Indicates the compound was analyzed for, but not detected.  
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.  
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.  
TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 514230

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 514564

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.  
L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.  
M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.  
R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414592

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414592001	MW-6s	EPA 8260B	514230		
10414592002	MW-12s	EPA 8260B	514230		
10414592003	MW-11s	EPA 8260B	514230		
10414592004	MW-10s	EPA 8260B	514230		
10414592005	MW-7s	EPA 8260B	514230		
10414592006	MW-8s	EPA 8260B	514564		
10414592007	MW-9s	EPA 8260B	514230		
10414592008	MW-21d	EPA 8260B	514230		
10414592009	MW-20d	EPA 8260B	514564		
10414592010	Trip Blank	EPA 8260B	514230		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10414592

### Section A

**Required Client Information:**

Company: CH2M Hill  
Address: 999 W. Riverside Ave, Suite 500  
Spokane, WA 99201  
Email:  
Phone: Fax:  
Requested Due Date: 10 Day Standard

### Section B

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
Copy To: Steve Demus, Lindsey Baumann  
Copy To: David Hodson, UPRR-Sysdat@ghd.com  
Purchase Order # PEDD# 1497-39-Rev1  
Project Name: Freeman WA-Grain Handling Facility  
Project #: 1497

### Section C

**Invoice Information:**

Attention: Anne Walsh  
Company: UPRR  
Address: 1400 W. 52nd Ave, Denver, CO 80221  
Pace Quote: Contract# 758938  
Pace Project Manager: Jennifer Gross  
Pace Profile #: 36447

Regulatory Agency: \_\_\_\_\_

State / Location: WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, ) Sample Ids must be unique	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soft/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test Y/N	Y	Requested Analysis Filtered (Y/N)									
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other	Low Level VOCs by 8260			6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 8310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2	
						DATE	TIME	DATE	TIME																					
1	MW-60S	WTG	G			2017	12/14	815	-	-	-	3			X															001
2	MW-12S	WTG	G				12/14	900	-	-	-	3			X															002
3	MW-11S	WTG	G				12/14	920	-	-	-	3			X															003
4	MW-10S	WTG	G				12/14	950	-	-	-	3			X															004
5	MW-7S	WTG	G				12/14	1020	-	-	-	3			X															005
6	MW-1S	WTG	G				12/14	1105	-	-	-	3			X															006
7	MW-8S	WTG	G				12/14	1120	-	-	-	3			X															007
8	MW-9S	WTG	G				12/14	1145	-	-	-	3			X															008
9	MW-21d	WTG	G				12/14	1435	-	-	-	3			X															009
10	MW-20d	WTG	G				12/14	1500	-	-	-	3			X															010
11	Trip Blank	WTG	G				12/14	-	-	-	-	2			X															010

007 12-15-17  
008 12-15-17  
009 12-15-17  
010 12-15-17

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	John C. CH2M	12/14/17		Alexander	12-15-17	9:15	50 Y Y Y
*Field filtered by client							50

**SAMPLER NAME AND SIGNATURE:**


PRINT Name of SAMPLER: Jonathan Espinoza

SIGNATURE of SAMPLER: [Signature]

DATE Signed: 12/14/17

TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)



	Document Name: <b>Sample Condition Upon Receipt Form - ESI</b>	Document Revised: 30Aug2017 Page 1 of 2
	Document No.: <b>F-MN-L-210-rev.23</b>	Issuing Authority: Pace Minnesota Quality Office

**Sample Condition Upon Receipt - ESI Tech Specs**     
 Client Name: CH2M Hill     
 Project #: **WO#: 10414592**

Courier:  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     SpeeDee     Other: \_\_\_\_\_  
 Tracking Number: 747590306 4430/41

Custody Seal on Cooler/Box Present?  Yes     No     
 Seals Intact?  Yes     No     
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Packing Material:  Bubble Wrap     Bubble Bags     None     Other: PB     
 Temp Blank?  Yes     No  
 Thermometer  151401163     G87A9155100842     
 Type of Ice:  Wet     Blue     None     Samples on ice, cooling process has begun  
 Used: \_\_\_\_\_     
 Cooler Temp Read (°C): 5.7, 5.5    Cooler Temp Corrected (°C): 5.8, 5.6   
 Biological Tissue Frozen?  Yes     No     NA  
 Temp should be above freezing to 6°C    Correction Factor: +0.1   
 Date and Initials of Person Examining Contents: GM 12-15-17

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No     
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	Yes	No	N/A	COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		6. <u>GM 12-15-17</u>
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		8. <u>NO MS/MSD</u>
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9.
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		12. <u>Did not receive sample MW-1s</u>
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>				
All containers needing acid/base preservation have been checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: (VOA) Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	14. <u>MW-21d 73N69476mm All other vials no headspace</u>
3 Trip Blanks Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	15. <u>TWO trip blanks</u>
Trip Blank Custody Seals Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>Not Pace</u>				

**CLIENT NOTIFICATION/RESOLUTION**     
 Field Data Required?  Yes     No  
 Person Contacted: Lindsey/ Steve     
 Date/Time: 12/15/17

Comments/Resolution: Client did not collect MW-1s

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1140</u>	Temp: <u>5.57</u>	Corrected Temp: <u>5.4, 5.8</u>
Time: <u>1200</u>	put in cooler	
Time:	Temp:	Corrected Temp:

Project Manager Review: JENNI GROSS     
 Date: 12/15/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance, this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 28, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

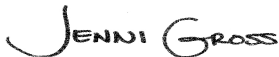
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414596

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 15, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414596001	MW-6s	Water	12/14/17 08:15	12/15/17 09:45
10414596002	MW-12s	Water	12/14/17 09:00	12/15/17 09:45
10414596003	MW-11s	Water	12/14/17 09:20	12/15/17 09:45
10414596004	MW-10s	Water	12/14/17 09:50	12/15/17 09:45
10414596005	MW-7s	Water	12/14/17 10:20	12/15/17 09:45
10414596006	MW-8s	Water	12/14/17 11:20	12/15/17 09:45
10414596007	MW-9s	Water	12/14/17 11:45	12/15/17 09:45
10414596008	MW-21d	Water	12/14/17 13:35	12/15/17 09:45
10414596009	MW-20d	Water	12/14/17 15:00	12/15/17 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414596001	MW-6s	RSK 175	DR1	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414596002	MW-12s	RSK 175	DR1	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414596003	MW-11s	RSK 175	DR1	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414596004	MW-10s	RSK 175	DR1	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414596

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414596005	MW-7s	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	DR1	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
10414596006	MW-8s	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	DR1	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
10414596007	MW-9s	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MLS	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
10414596008	MW-21d	EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
		RSK 175	MLS	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
<b>10414596009</b>	<b>MW-20d</b>	RSK 175	MLS	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10414596001</b>	<b>MW-6s</b>					
RSK 175	Methane	3.6J	ug/L	10.0	12/20/17 10:47	
6010C Met	Aluminum, Dissolved	78.6J	ug/L	200	12/27/17 21:26	
6010C Met	Barium, Dissolved	30.3	ug/L	10.0	12/27/17 21:26	
6010C Met	Calcium, Dissolved	33000	ug/L	500	12/27/17 21:26	
6010C Met	Iron, Dissolved	84.1	ug/L	50.0	12/27/17 21:26	
6010C Met	Magnesium, Dissolved	9060	ug/L	500	12/27/17 21:26	
6010C Met	Manganese, Dissolved	2.0J	ug/L	5.0	12/27/17 21:26	
6010C Met	Potassium, Dissolved	464J	ug/L	2500	12/27/17 21:26	
6010C Met	Sodium, Dissolved	10900	ug/L	1000	12/27/17 21:26	
6010C Met	Vanadium, Dissolved	5.1J	ug/L	15.0	12/27/17 21:26	
6010C Met	Zinc, Dissolved	2.3J	ug/L	20.0	12/27/17 21:26	
SM 2320B	Alkalinity, Total as CaCO3	159	mg/L	5.0	12/19/17 13:23	
SM 2540C	Total Dissolved Solids	217	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	1.6	mg/L	1.2	12/15/17 17:18	M1
EPA 300.0	Nitrate as N	0.089J	mg/L	0.10	12/15/17 17:18	M1
EPA 300.0	Sulfate	1.8	mg/L	1.2	12/15/17 17:18	M1
EPA 353.2	Nitrogen, NO2 plus NO3	0.089	mg/L	0.020	12/23/17 13:26	
SM 5310C	Total Organic Carbon	0.83J	mg/L	1.0	12/21/17 02:15	
<b>10414596002</b>	<b>MW-12s</b>					
RSK 175	Methane	9.6J	ug/L	10.0	12/20/17 10:54	
6010C Met	Aluminum, Dissolved	36.7J	ug/L	200	12/27/17 21:29	
6010C Met	Barium, Dissolved	181	ug/L	10.0	12/27/17 21:29	
6010C Met	Calcium, Dissolved	73300	ug/L	500	12/27/17 21:29	
6010C Met	Copper, Dissolved	0.90J	ug/L	10.0	12/27/17 21:29	
6010C Met	Iron, Dissolved	22.6J	ug/L	50.0	12/27/17 21:29	
6010C Met	Magnesium, Dissolved	21400	ug/L	500	12/27/17 21:29	
6010C Met	Manganese, Dissolved	55.8	ug/L	5.0	12/27/17 21:29	
6010C Met	Nickel, Dissolved	1.5J	ug/L	20.0	12/27/17 21:29	
6010C Met	Potassium, Dissolved	419J	ug/L	2500	12/27/17 21:29	
6010C Met	Sodium, Dissolved	32900	ug/L	1000	12/27/17 21:29	
6010C Met	Vanadium, Dissolved	2.5J	ug/L	15.0	12/27/17 21:29	
6010C Met	Zinc, Dissolved	5.8J	ug/L	20.0	12/27/17 21:29	
SM 2320B	Alkalinity, Total as CaCO3	239	mg/L	5.0	12/21/17 14:19	
SM 2540C	Total Dissolved Solids	502	mg/L	20.0	12/20/17 13:22	
SM 4500-S-2 D	Sulfide, Total	0.0084J	mg/L	0.020	12/19/17 12:08	
EPA 300.0	Chloride	42.3	mg/L	1.2	12/15/17 18:21	M1
EPA 300.0	Nitrate as N	5.9	mg/L	0.10	12/15/17 18:21	M1
EPA 300.0	Sulfate	40.8	mg/L	1.2	12/15/17 18:21	M1
EPA 353.2	Nitrogen, NO2 plus NO3	5.8	mg/L	0.10	12/23/17 15:02	
SM 5310C	Total Organic Carbon	3.1	mg/L	1.0	12/21/17 02:29	
<b>10414596003</b>	<b>MW-11s</b>					
RSK 175	Methane	5.8J	ug/L	10.0	12/20/17 11:02	
6010C Met	Barium, Dissolved	46.5	ug/L	10.0	12/27/17 21:33	
6010C Met	Calcium, Dissolved	42700	ug/L	500	12/27/17 21:33	
6010C Met	Magnesium, Dissolved	12200	ug/L	500	12/27/17 21:33	
6010C Met	Manganese, Dissolved	67.3	ug/L	5.0	12/27/17 21:33	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10414596003</b>	<b>MW-11s</b>					
6010C Met	Potassium, Dissolved	670J	ug/L	2500	12/27/17 21:33	
6010C Met	Sodium, Dissolved	18100	ug/L	1000	12/27/17 21:33	
6010C Met	Thallium, Dissolved	5.8J	ug/L	20.0	12/27/17 21:33	
6010C Met	Vanadium, Dissolved	5.5J	ug/L	15.0	12/27/17 21:33	
6010C Met	Zinc, Dissolved	2.4J	ug/L	20.0	12/27/17 21:33	
SM 2320B	Alkalinity, Total as CaCO3	204	mg/L	5.0	12/21/17 14:23	
SM 2540C	Total Dissolved Solids	249	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	1.0J	mg/L	1.2	12/15/17 20:10	
EPA 300.0	Nitrate as N	0.073J	mg/L	0.10	12/15/17 20:10	
EPA 300.0	Sulfate	3.0	mg/L	1.2	12/15/17 20:10	
EPA 353.2	Nitrogen, NO2 plus NO3	0.070	mg/L	0.020	12/23/17 13:28	
SM 5310C	Total Organic Carbon	0.30J	mg/L	1.0	12/21/17 02:44	
<b>10414596004</b>	<b>MW-10s</b>					
RSK 175	Methane	5.2J	ug/L	10.0	12/20/17 11:09	
6010C Met	Aluminum, Dissolved	15.9J	ug/L	200	12/27/17 21:37	
6010C Met	Barium, Dissolved	35.0	ug/L	10.0	12/27/17 21:37	
6010C Met	Calcium, Dissolved	71000	ug/L	500	12/27/17 21:37	
6010C Met	Copper, Dissolved	0.88J	ug/L	10.0	12/27/17 21:37	
6010C Met	Iron, Dissolved	19.6J	ug/L	50.0	12/27/17 21:37	
6010C Met	Magnesium, Dissolved	19900	ug/L	500	12/27/17 21:37	
6010C Met	Manganese, Dissolved	1.0J	ug/L	5.0	12/27/17 21:37	
6010C Met	Potassium, Dissolved	389J	ug/L	2500	12/27/17 21:37	
6010C Met	Sodium, Dissolved	14000	ug/L	1000	12/27/17 21:37	
6010C Met	Thallium, Dissolved	4.9J	ug/L	20.0	12/27/17 21:37	
6010C Met	Vanadium, Dissolved	2.8J	ug/L	15.0	12/27/17 21:37	
6010C Met	Zinc, Dissolved	8.7J	ug/L	20.0	12/27/17 21:37	
SM 2320B	Alkalinity, Total as CaCO3	305	mg/L	5.0	12/21/17 14:27	
SM 2540C	Total Dissolved Solids	335	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	0.95J	mg/L	1.2	12/15/17 20:25	
EPA 300.0	Nitrate as N	0.17	mg/L	0.10	12/15/17 20:25	
EPA 300.0	Sulfate	2.1	mg/L	1.2	12/15/17 20:25	
EPA 353.2	Nitrogen, NO2 plus NO3	0.20	mg/L	0.020	12/23/17 13:29	
SM 5310C	Total Organic Carbon	0.67J	mg/L	1.0	12/21/17 03:26	
<b>10414596005</b>	<b>MW-7s</b>					
RSK 175	Methane	4.1J	ug/L	10.0	12/20/17 11:16	
6010C Met	Barium, Dissolved	17.3	ug/L	10.0	12/27/17 21:41	
6010C Met	Calcium, Dissolved	32100	ug/L	500	12/27/17 21:41	
6010C Met	Magnesium, Dissolved	8390	ug/L	500	12/27/17 21:41	
6010C Met	Manganese, Dissolved	0.60J	ug/L	5.0	12/27/17 21:41	
6010C Met	Potassium, Dissolved	275J	ug/L	2500	12/27/17 21:41	
6010C Met	Sodium, Dissolved	10200	ug/L	1000	12/27/17 21:41	
6010C Met	Vanadium, Dissolved	1.3J	ug/L	15.0	12/27/17 21:41	
6010C Met	Zinc, Dissolved	5.5J	ug/L	20.0	12/27/17 21:41	
SM 2320B	Alkalinity, Total as CaCO3	89.1	mg/L	5.0	12/21/17 14:32	
SM 2540C	Total Dissolved Solids	219	mg/L	10.0	12/20/17 13:22	
SM 4500-S-2 D	Sulfide, Total	0.22	mg/L	0.020	12/19/17 12:13	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10414596005</b>	<b>MW-7s</b>					
EPA 300.0	Chloride	9.6	mg/L	1.2	12/15/17 20:40	
EPA 300.0	Nitrate as N	8.3	mg/L	0.20	12/16/17 00:45	
EPA 300.0	Sulfate	18.9	mg/L	1.2	12/15/17 20:40	
EPA 353.2	Nitrogen, NO2 plus NO3	8.0	mg/L	0.20	12/23/17 15:03	
SM 5310C	Total Organic Carbon	0.82J	mg/L	1.0	12/21/17 03:40	
<b>10414596006</b>	<b>MW-8s</b>					
RSK 175	Methane	4.1J	ug/L	10.0	12/20/17 11:23	
6010C Met	Aluminum, Dissolved	109J	ug/L	200	12/27/17 21:45	
6010C Met	Barium, Dissolved	36.7	ug/L	10.0	12/27/17 21:45	
6010C Met	Calcium, Dissolved	41600	ug/L	500	12/27/17 21:45	
6010C Met	Copper, Dissolved	0.84J	ug/L	10.0	12/27/17 21:45	
6010C Met	Iron, Dissolved	208	ug/L	50.0	12/27/17 21:45	
6010C Met	Magnesium, Dissolved	9830	ug/L	500	12/27/17 21:45	
6010C Met	Manganese, Dissolved	35.1	ug/L	5.0	12/27/17 21:45	
6010C Met	Potassium, Dissolved	277J	ug/L	2500	12/27/17 21:45	
6010C Met	Sodium, Dissolved	10800	ug/L	1000	12/27/17 21:45	
6010C Met	Vanadium, Dissolved	1.6J	ug/L	15.0	12/27/17 21:45	
6010C Met	Zinc, Dissolved	4.9J	ug/L	20.0	12/27/17 21:45	
SM 2320B	Alkalinity, Total as CaCO3	131	mg/L	5.0	12/21/17 14:35	
SM 2540C	Total Dissolved Solids	268	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	2.0	mg/L	1.2	12/15/17 20:55	
EPA 300.0	Nitrate as N	8.3	mg/L	0.20	12/16/17 01:04	
EPA 300.0	Sulfate	20.5	mg/L	1.2	12/15/17 20:55	
EPA 353.2	Nitrogen, NO2 plus NO3	8.7	mg/L	0.20	12/23/17 15:04	
SM 5310C	Total Organic Carbon	1.2	mg/L	1.0	12/21/17 03:55	
<b>10414596007</b>	<b>MW-9s</b>					
RSK 175	Methane	4.8J	ug/L	10.0	12/20/17 13:30	
6010C Met	Aluminum, Dissolved	11.5J	ug/L	200	12/27/17 21:56	
6010C Met	Barium, Dissolved	63.0	ug/L	10.0	12/27/17 21:56	
6010C Met	Calcium, Dissolved	60100	ug/L	500	12/27/17 21:56	
6010C Met	Copper, Dissolved	1.8J	ug/L	10.0	12/27/17 21:56	
6010C Met	Iron, Dissolved	16.9J	ug/L	50.0	12/27/17 21:56	
6010C Met	Magnesium, Dissolved	13400	ug/L	500	12/27/17 21:56	
6010C Met	Manganese, Dissolved	31.2	ug/L	5.0	12/27/17 21:56	
6010C Met	Potassium, Dissolved	1240J	ug/L	2500	12/27/17 21:56	
6010C Met	Sodium, Dissolved	14400	ug/L	1000	12/27/17 21:56	
6010C Met	Thallium, Dissolved	6.3J	ug/L	20.0	12/27/17 21:56	
6010C Met	Vanadium, Dissolved	1.2J	ug/L	15.0	12/27/17 21:56	
6010C Met	Zinc, Dissolved	5.4J	ug/L	20.0	12/27/17 21:56	
SM 2320B	Alkalinity, Total as CaCO3	82.2	mg/L	5.0	12/21/17 14:39	
SM 2540C	Total Dissolved Solids	403	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	37.2	mg/L	1.2	12/15/17 21:10	
EPA 300.0	Nitrate as N	14.3	mg/L	0.50	12/16/17 01:21	
EPA 300.0	Sulfate	71.6	mg/L	1.2	12/15/17 21:10	
EPA 353.2	Nitrogen, NO2 plus NO3	15.3	mg/L	0.40	12/23/17 15:05	
SM 5310C	Total Organic Carbon	1.6	mg/L	1.0	12/21/17 04:09	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414596008</b>	<b>MW-21d</b>					
RSK 175	Methane	3.8J	ug/L	10.0	12/20/17 13:37	
6010C Met	Barium, Dissolved	66.2	ug/L	10.0	12/27/17 22:00	
6010C Met	Calcium, Dissolved	20600	ug/L	500	12/27/17 22:00	
6010C Met	Copper, Dissolved	2.1J	ug/L	10.0	12/27/17 22:00	
6010C Met	Iron, Dissolved	199	ug/L	50.0	12/27/17 22:00	
6010C Met	Magnesium, Dissolved	18200	ug/L	500	12/27/17 22:00	
6010C Met	Manganese, Dissolved	81.8	ug/L	5.0	12/27/17 22:00	
6010C Met	Potassium, Dissolved	3880	ug/L	2500	12/27/17 22:00	
6010C Met	Sodium, Dissolved	21300	ug/L	1000	12/27/17 22:00	
SM 2320B	Alkalinity, Total as CaCO3	184	mg/L	5.0	12/21/17 14:42	
SM 2540C	Total Dissolved Solids	216	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	2.8	mg/L	1.2	12/15/17 21:25	
EPA 300.0	Sulfate	8.1	mg/L	1.2	12/15/17 21:25	
SM 5310C	Total Organic Carbon	0.47J	mg/L	1.0	12/21/17 04:23	
<b>10414596009</b>	<b>MW-20d</b>					
RSK 175	Methane	4.8J	ug/L	10.0	12/20/17 14:19	
6010C Met	Barium, Dissolved	22.1	ug/L	10.0	12/27/17 22:04	
6010C Met	Calcium, Dissolved	54400	ug/L	500	12/27/17 22:04	
6010C Met	Copper, Dissolved	2.2J	ug/L	10.0	12/27/17 22:04	
6010C Met	Magnesium, Dissolved	19800	ug/L	500	12/27/17 22:04	
6010C Met	Manganese, Dissolved	15.0	ug/L	5.0	12/27/17 22:04	
6010C Met	Potassium, Dissolved	3320	ug/L	2500	12/27/17 22:04	
6010C Met	Sodium, Dissolved	18800	ug/L	1000	12/27/17 22:04	
6010C Met	Vanadium, Dissolved	4.9J	ug/L	15.0	12/27/17 22:04	
6010C Met	Zinc, Dissolved	2.2J	ug/L	20.0	12/27/17 22:04	
SM 2320B	Alkalinity, Total as CaCO3	258	mg/L	5.0	12/21/17 14:46	
SM 2540C	Total Dissolved Solids	320	mg/L	10.0	12/20/17 13:22	
EPA 300.0	Chloride	5.7	mg/L	1.2	12/15/17 21:40	
EPA 300.0	Nitrate as N	1.2	mg/L	0.10	12/15/17 21:40	
EPA 300.0	Sulfate	7.9	mg/L	1.2	12/15/17 21:40	
EPA 353.2	Nitrogen, NO2 plus NO3	1.3	mg/L	0.020	12/23/17 13:37	
SM 5310C	Total Organic Carbon	0.83J	mg/L	1.0	12/21/17 04:37	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 514687

R1: RPD value was outside control limits.

- DUP (Lab ID: 2799011)
- Methane

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 514454

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414343003,10414554006

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2797611)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

### General Information:

9 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 97199

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2067205001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 418257)
- Sulfide, Total

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 513963

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414596001,10414596002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2795019)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2795018)
  - Chloride
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2795020)
  - Chloride
  - Nitrate as N
  - Sulfate

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** December 28, 2017

**General Information:**

9 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-6s**      **Lab ID: 10414596001**      Collected: 12/14/17 08:15      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 10:47	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 10:47	74-85-1	
Methane	3.6J	ug/L	10.0	1.1	1		12/20/17 10:47	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	78.6J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:26	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:26	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:26	7440-38-2	
Barium, Dissolved	30.3	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:26	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:26	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:26	7440-43-9	
Calcium, Dissolved	33000	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:26	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:26	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:26	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:26	7440-50-8	
Iron, Dissolved	84.1	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:26	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:26	7439-92-1	
Magnesium, Dissolved	9060	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:26	7439-95-4	
Manganese, Dissolved	2.0J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:26	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:26	7440-02-0	
Potassium, Dissolved	464J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:26	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:26	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:26	7440-22-4	
Sodium, Dissolved	10900	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:26	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:26	7440-28-0	
Vanadium, Dissolved	5.1J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:26	7440-62-2	
Zinc, Dissolved	2.3J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:26	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:22	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	159	mg/L	5.0	1.4	1		12/19/17 13:23		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	217	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:07	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.6	mg/L	1.2	0.14	1		12/15/17 17:18	16887-00-6	M1
Nitrate as N	0.089J	mg/L	0.10	0.0079	1		12/15/17 17:18	14797-55-8	M1
Sulfate	1.8	mg/L	1.2	0.27	1		12/15/17 17:18	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-6s**      **Lab ID: 10414596001**    Collected: 12/14/17 08:15    Received: 12/15/17 09:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.089</b>	mg/L	0.020	0.0075	1		12/23/17 13:26		
<b>410.4 COD</b>	Analytical Method: EPA 410.4    Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:15		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.83J</b>	mg/L	1.0	0.20	1		12/21/17 02:15	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-12s**      **Lab ID: 10414596002**      Collected: 12/14/17 09:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 10:54	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 10:54	74-85-1	
Methane	9.6J	ug/L	10.0	1.1	1		12/20/17 10:54	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	36.7J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:29	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:29	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:29	7440-38-2	
Barium, Dissolved	181	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:29	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:29	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:29	7440-43-9	
Calcium, Dissolved	73300	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:29	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:29	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:29	7440-48-4	
Copper, Dissolved	0.90J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:29	7440-50-8	
Iron, Dissolved	22.6J	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:29	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:29	7439-92-1	
Magnesium, Dissolved	21400	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:29	7439-95-4	
Manganese, Dissolved	55.8	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:29	7439-96-5	
Nickel, Dissolved	1.5J	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:29	7440-02-0	
Potassium, Dissolved	419J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:29	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:29	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:29	7440-22-4	
Sodium, Dissolved	32900	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:29	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:29	7440-28-0	
Vanadium, Dissolved	2.5J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:29	7440-62-2	
Zinc, Dissolved	5.8J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:29	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:25	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	239	mg/L	5.0	1.4	1		12/21/17 14:19		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	502	mg/L	20.0	10.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0084J	mg/L	0.020	0.0050	1		12/19/17 12:08	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	42.3	mg/L	1.2	0.14	1		12/15/17 18:21	16887-00-6	M1
Nitrate as N	5.9	mg/L	0.10	0.0079	1		12/15/17 18:21	14797-55-8	M1
Sulfate	40.8	mg/L	1.2	0.27	1		12/15/17 18:21	14808-79-8	M1

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-12s**      **Lab ID: 10414596002**      Collected: 12/14/17 09:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>5.8</b>	mg/L	0.10	0.037	5		12/23/17 15:02		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:15		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.1</b>	mg/L	1.0	0.20	1		12/21/17 02:29	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-11s**      **Lab ID: 10414596003**      Collected: 12/14/17 09:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 11:02	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 11:02	74-85-1	
Methane	5.8J	ug/L	10.0	1.1	1		12/20/17 11:02	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:33	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:33	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:33	7440-38-2	
Barium, Dissolved	46.5	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:33	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:33	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:33	7440-43-9	
Calcium, Dissolved	42700	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:33	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:33	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:33	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:33	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:33	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:33	7439-92-1	
Magnesium, Dissolved	12200	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:33	7439-95-4	
Manganese, Dissolved	67.3	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:33	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:33	7440-02-0	
Potassium, Dissolved	670J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:33	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:33	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:33	7440-22-4	
Sodium, Dissolved	18100	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:33	7440-23-5	
Thallium, Dissolved	5.8J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:33	7440-28-0	
Vanadium, Dissolved	5.5J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:33	7440-62-2	
Zinc, Dissolved	2.4J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:33	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:27	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	204	mg/L	5.0	1.4	1		12/21/17 14:23		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	249	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:10	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.0J	mg/L	1.2	0.14	1		12/15/17 20:10	16887-00-6	
Nitrate as N	0.073J	mg/L	0.10	0.0079	1		12/15/17 20:10	14797-55-8	
Sulfate	3.0	mg/L	1.2	0.27	1		12/15/17 20:10	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-11s**      **Lab ID: 10414596003**      Collected: 12/14/17 09:20      Received: 12/15/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.070</b>	mg/L	0.020	0.0075	1		12/23/17 13:28		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:15		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.30J</b>	mg/L	1.0	0.20	1		12/21/17 02:44	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-10s**      **Lab ID: 10414596004**      Collected: 12/14/17 09:50      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 11:09	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 11:09	74-85-1	
Methane	5.2J	ug/L	10.0	1.1	1		12/20/17 11:09	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	15.9J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:37	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:37	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:37	7440-38-2	
Barium, Dissolved	35.0	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:37	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:37	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:37	7440-43-9	
Calcium, Dissolved	71000	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:37	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:37	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:37	7440-48-4	
Copper, Dissolved	0.88J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:37	7440-50-8	
Iron, Dissolved	19.6J	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:37	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:37	7439-92-1	
Magnesium, Dissolved	19900	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:37	7439-95-4	
Manganese, Dissolved	1.0J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:37	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:37	7440-02-0	
Potassium, Dissolved	389J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:37	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:37	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:37	7440-22-4	
Sodium, Dissolved	14000	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:37	7440-23-5	
Thallium, Dissolved	4.9J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:37	7440-28-0	
Vanadium, Dissolved	2.8J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:37	7440-62-2	
Zinc, Dissolved	8.7J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:37	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:29	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	305	mg/L	5.0	1.4	1		12/21/17 14:27		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	335	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:11	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	0.95J	mg/L	1.2	0.14	1		12/15/17 20:25	16887-00-6	
Nitrate as N	0.17	mg/L	0.10	0.0079	1		12/15/17 20:25	14797-55-8	
Sulfate	2.1	mg/L	1.2	0.27	1		12/15/17 20:25	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-10s**      **Lab ID: 10414596004**    Collected: 12/14/17 09:50    Received: 12/15/17 09:45    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.20</b>	mg/L	0.020	0.0075	1		12/23/17 13:29		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4    Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:15		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.67J</b>	mg/L	1.0	0.20	1		12/21/17 03:26	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-7s**      **Lab ID: 10414596005**      Collected: 12/14/17 10:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 11:16	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 11:16	74-85-1	
Methane	4.1J	ug/L	10.0	1.1	1		12/20/17 11:16	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:41	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:41	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:41	7440-38-2	
Barium, Dissolved	17.3	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:41	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:41	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:41	7440-43-9	
Calcium, Dissolved	32100	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:41	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:41	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:41	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:41	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:41	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:41	7439-92-1	
Magnesium, Dissolved	8390	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:41	7439-95-4	
Manganese, Dissolved	0.60J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:41	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:41	7440-02-0	
Potassium, Dissolved	275J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:41	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:41	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:41	7440-22-4	
Sodium, Dissolved	10200	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:41	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:41	7440-28-0	
Vanadium, Dissolved	1.3J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:41	7440-62-2	
Zinc, Dissolved	5.5J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:41	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:32	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	89.1	mg/L	5.0	1.4	1		12/21/17 14:32		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	219	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.22	mg/L	0.020	0.0050	1		12/19/17 12:13	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	9.6	mg/L	1.2	0.14	1		12/15/17 20:40	16887-00-6	
Nitrate as N	8.3	mg/L	0.20	0.016	2		12/16/17 00:45	14797-55-8	
Sulfate	18.9	mg/L	1.2	0.27	1		12/15/17 20:40	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-7s**      **Lab ID: 10414596005**      Collected: 12/14/17 10:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>8.0</b>	mg/L	0.20	0.075	10		12/23/17 15:03		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:15		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.82J</b>	mg/L	1.0	0.20	1		12/21/17 03:40	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-8s**      **Lab ID: 10414596006**      Collected: 12/14/17 11:20      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 11:23	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 11:23	74-85-1	
Methane	4.1J	ug/L	10.0	1.1	1		12/20/17 11:23	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	109J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:45	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:45	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:45	7440-38-2	
Barium, Dissolved	36.7	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:45	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:45	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:45	7440-43-9	
Calcium, Dissolved	41600	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:45	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:45	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:45	7440-48-4	
Copper, Dissolved	0.84J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:45	7440-50-8	
Iron, Dissolved	208	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:45	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:45	7439-92-1	
Magnesium, Dissolved	9830	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:45	7439-95-4	
Manganese, Dissolved	35.1	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:45	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:45	7440-02-0	
Potassium, Dissolved	277J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:45	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:45	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:45	7440-22-4	
Sodium, Dissolved	10800	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:45	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:45	7440-28-0	
Vanadium, Dissolved	1.6J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:45	7440-62-2	
Zinc, Dissolved	4.9J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:45	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:34	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	131	mg/L	5.0	1.4	1		12/21/17 14:35		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	268	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:14	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.0	mg/L	1.2	0.14	1		12/15/17 20:55	16887-00-6	
Nitrate as N	8.3	mg/L	0.20	0.016	2		12/16/17 01:04	14797-55-8	
Sulfate	20.5	mg/L	1.2	0.27	1		12/15/17 20:55	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-8s**      **Lab ID: 10414596006**      Collected: 12/14/17 11:20      Received: 12/15/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>8.7</b>	mg/L	0.20	0.075	10		12/23/17 15:04		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:16		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.2</b>	mg/L	1.0	0.20	1		12/21/17 03:55	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-9s**      **Lab ID: 10414596007**      Collected: 12/14/17 11:45      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 13:30	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 13:30	74-85-1	
Methane	4.8J	ug/L	10.0	1.1	1		12/20/17 13:30	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	11.5J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 21:56	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 21:56	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 21:56	7440-38-2	
Barium, Dissolved	63.0	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 21:56	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 21:56	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 21:56	7440-43-9	
Calcium, Dissolved	60100	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 21:56	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 21:56	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 21:56	7440-48-4	
Copper, Dissolved	1.8J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 21:56	7440-50-8	
Iron, Dissolved	16.9J	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 21:56	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 21:56	7439-92-1	
Magnesium, Dissolved	13400	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 21:56	7439-95-4	
Manganese, Dissolved	31.2	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 21:56	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 21:56	7440-02-0	
Potassium, Dissolved	1240J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 21:56	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 21:56	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 21:56	7440-22-4	
Sodium, Dissolved	14400	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 21:56	7440-23-5	
Thallium, Dissolved	6.3J	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 21:56	7440-28-0	
Vanadium, Dissolved	1.2J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 21:56	7440-62-2	
Zinc, Dissolved	5.4J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 21:56	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:41	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	82.2	mg/L	5.0	1.4	1		12/21/17 14:39		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	403	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:16	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	37.2	mg/L	1.2	0.14	1		12/15/17 21:10	16887-00-6	
Nitrate as N	14.3	mg/L	0.50	0.040	5		12/16/17 01:21	14797-55-8	
Sulfate	71.6	mg/L	1.2	0.27	1		12/15/17 21:10	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-9s**      **Lab ID: 10414596007**      Collected: 12/14/17 11:45      Received: 12/15/17 09:45      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>15.3</b>	mg/L	0.40	0.15	20		12/23/17 15:05		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:16		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.6</b>	mg/L	1.0	0.20	1		12/21/17 04:09	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-21d**      **Lab ID: 10414596008**      Collected: 12/14/17 13:35      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 13:37	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 13:37	74-85-1	
Methane	3.8J	ug/L	10.0	1.1	1		12/20/17 13:37	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 22:00	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 22:00	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 22:00	7440-38-2	
Barium, Dissolved	66.2	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 22:00	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 22:00	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 22:00	7440-43-9	
Calcium, Dissolved	20600	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 22:00	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 22:00	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 22:00	7440-48-4	
Copper, Dissolved	2.1J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 22:00	7440-50-8	
Iron, Dissolved	199	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 22:00	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 22:00	7439-92-1	
Magnesium, Dissolved	18200	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 22:00	7439-95-4	
Manganese, Dissolved	81.8	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 22:00	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 22:00	7440-02-0	
Potassium, Dissolved	3880	ug/L	2500	126	1	12/21/17 13:52	12/27/17 22:00	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 22:00	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 22:00	7440-22-4	
Sodium, Dissolved	21300	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 22:00	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 22:00	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 22:00	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 22:00	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:43	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	184	mg/L	5.0	1.4	1		12/21/17 14:42		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	216	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:17	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.8	mg/L	1.2	0.14	1		12/15/17 21:25	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		12/15/17 21:25	14797-55-8	
Sulfate	8.1	mg/L	1.2	0.27	1		12/15/17 21:25	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-21d**      **Lab ID: 10414596008**      Collected: 12/14/17 13:35      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		12/23/17 13:36		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:16		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.47J</b>	mg/L	1.0	0.20	1		12/21/17 04:23	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

**Sample: MW-20d**      **Lab ID: 10414596009**      Collected: 12/14/17 15:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/20/17 14:19	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/20/17 14:19	74-85-1	
Methane	4.8J	ug/L	10.0	1.1	1		12/20/17 14:19	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 22:04	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 22:04	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 22:04	7440-38-2	
Barium, Dissolved	22.1	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 22:04	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 22:04	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 22:04	7440-43-9	
Calcium, Dissolved	54400	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 22:04	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 22:04	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 22:04	7440-48-4	
Copper, Dissolved	2.2J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 22:04	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 22:04	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 22:04	7439-92-1	
Magnesium, Dissolved	19800	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 22:04	7439-95-4	
Manganese, Dissolved	15.0	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 22:04	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 22:04	7440-02-0	
Potassium, Dissolved	3320	ug/L	2500	126	1	12/21/17 13:52	12/27/17 22:04	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 22:04	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 22:04	7440-22-4	
Sodium, Dissolved	18800	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 22:04	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 22:04	7440-28-0	
Vanadium, Dissolved	4.9J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 22:04	7440-62-2	
Zinc, Dissolved	2.2J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 22:04	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:45	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	258	mg/L	5.0	1.4	1		12/21/17 14:46		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	320	mg/L	10.0	5.0	1		12/20/17 13:22		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/19/17 12:19	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.7	mg/L	1.2	0.14	1		12/15/17 21:40	16887-00-6	
Nitrate as N	1.2	mg/L	0.10	0.0079	1		12/15/17 21:40	14797-55-8	
Sulfate	7.9	mg/L	1.2	0.27	1		12/15/17 21:40	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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**Sample: MW-20d**      **Lab ID: 10414596009**      Collected: 12/14/17 15:00      Received: 12/15/17 09:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.3</b>	mg/L	0.020	0.0075	1		12/23/17 13:37		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:17		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.83J</b>	mg/L	1.0	0.20	1		12/21/17 04:37	7440-44-0	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Project No.: 10414596

QC Batch: 514438 Analysis Method: RSK 175  
 QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006

METHOD BLANK: 2797555 Matrix: Water  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/20/17 08:44	
Ethene	ug/L	<0.68	10.0	0.68	12/20/17 08:44	
Methane	ug/L	4.7J	10.0	1.1	12/20/17 08:44	

LABORATORY CONTROL SAMPLE & LCSD: 2797556

Parameter	Units	2797557								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	111	110	98	96	85-115	1	20	
Ethene	ug/L	106	104	103	98	97	85-115	1	20	
Methane	ug/L	60.7	61.5	60.0	101	99	85-115	3	20	

SAMPLE DUPLICATE: 2797559

Parameter	Units	10414596006		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	<0.68	<0.68		20	
Methane	ug/L	4.1J	4.4J		20	

SAMPLE DUPLICATE: 2797572

Parameter	Units	10414911001		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	12100	14900	20	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 514687

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10414596007, 10414596008, 10414596009

METHOD BLANK: 2799007

Matrix: Water

Associated Lab Samples: 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/20/17 12:17	
Ethene	ug/L	<0.68	10.0	0.68	12/20/17 12:17	
Methane	ug/L	3.2J	10.0	1.1	12/20/17 12:17	

LABORATORY CONTROL SAMPLE & LCSD: 2799008

2799009

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	110	108	96	95	85-115	1	20	
Ethene	ug/L	106	103	102	97	96	85-115	2	20	
Methane	ug/L	60.7	60.0	60.2	99	99	85-115	0	20	

SAMPLE DUPLICATE: 2799010

Parameter	Units	7579170001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	0.0035J mg/L	5.4J		20	

SAMPLE DUPLICATE: 2799011

Parameter	Units	10414911007 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	288	216	29	20 R1	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 514122 Analysis Method: EPA 7470A  
 QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 2796191 Matrix: Water  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	12/27/17 16:55	

LABORATORY CONTROL SAMPLE: 2796192

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796193 2796194

Parameter	Units	10414407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	5.4	5.6	107	112	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796195 2796196

Parameter	Units	10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	<0.062	5	5	5.2	5.4	105	108	80-120	3	20	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 514108

Analysis Method: 6010C Met

QC Batch Method: EPA 3010

Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 2796133

Matrix: Water

Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	12/27/17 20:24	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	12/27/17 20:24	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	12/27/17 20:24	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	12/27/17 20:24	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	12/27/17 20:24	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	12/27/17 20:24	
Calcium, Dissolved	ug/L	<24.7	500	24.7	12/27/17 20:24	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	12/27/17 20:24	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	12/27/17 20:24	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	12/27/17 20:24	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	12/27/17 20:24	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	12/27/17 20:24	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	12/27/17 20:24	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	12/27/17 20:24	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	12/27/17 20:24	
Potassium, Dissolved	ug/L	<126	2500	126	12/27/17 20:24	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	12/27/17 20:24	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	12/27/17 20:24	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	12/27/17 20:24	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	12/27/17 20:24	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	12/27/17 20:24	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	12/27/17 20:24	

LABORATORY CONTROL SAMPLE: 2796134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19500	97	80-120	
Antimony, Dissolved	ug/L	1000	939	94	80-120	
Arsenic, Dissolved	ug/L	1000	916	92	80-120	
Barium, Dissolved	ug/L	1000	930	93	80-120	
Beryllium, Dissolved	ug/L	1000	943	94	80-120	
Cadmium, Dissolved	ug/L	1000	911	91	80-120	
Calcium, Dissolved	ug/L	20000	17600	88	80-120	
Chromium, Dissolved	ug/L	1000	922	92	80-120	
Cobalt, Dissolved	ug/L	1000	916	92	80-120	
Copper, Dissolved	ug/L	1000	885	88	80-120	
Iron, Dissolved	ug/L	20000	18200	91	80-120	
Lead, Dissolved	ug/L	1000	924	92	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

LABORATORY CONTROL SAMPLE: 2796134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Magnesium, Dissolved	ug/L	20000	17900	89	80-120	
Manganese, Dissolved	ug/L	1000	934	93	80-120	
Nickel, Dissolved	ug/L	1000	927	93	80-120	
Potassium, Dissolved	ug/L	20000	18000	90	80-120	
Selenium, Dissolved	ug/L	1000	972	97	80-120	
Silver, Dissolved	ug/L	500	443	89	80-120	
Sodium, Dissolved	ug/L	20000	18100	91	80-120	
Thallium, Dissolved	ug/L	1000	909	91	80-120	
Vanadium, Dissolved	ug/L	1000	874	87	80-120	
Zinc, Dissolved	ug/L	1000	933	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796135 2796136

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	<8.6	20000	20000	20200	19700	101	99	75-125	2	20		
Antimony, Dissolved	ug/L	<3.1	1000	1000	974	954	97	95	75-125	2	20		
Arsenic, Dissolved	ug/L	<5.2	1000	1000	947	935	95	94	75-125	1	20		
Barium, Dissolved	ug/L	20.5	1000	1000	976	961	96	94	75-125	2	20		
Beryllium, Dissolved	ug/L	<0.11	1000	1000	970	959	97	96	75-125	1	20		
Cadmium, Dissolved	ug/L	<0.46	1000	1000	934	920	93	92	75-125	2	20		
Calcium, Dissolved	ug/L	41800	20000	20000	60800	60400	95	93	75-125	1	20		
Chromium, Dissolved	ug/L	<0.50	1000	1000	944	932	94	93	75-125	1	20		
Cobalt, Dissolved	ug/L	<1.1	1000	1000	924	910	92	91	75-125	2	20		
Copper, Dissolved	ug/L	11.1	1000	1000	927	912	92	90	75-125	2	20		
Iron, Dissolved	ug/L	<16.7	20000	20000	18800	18400	94	92	75-125	2	20		
Lead, Dissolved	ug/L	<3.0	1000	1000	937	925	94	92	75-125	1	20		
Magnesium, Dissolved	ug/L	13000	20000	20000	31900	31600	95	93	75-125	1	20		
Manganese, Dissolved	ug/L	1.1J	1000	1000	952	939	95	94	75-125	1	20		
Nickel, Dissolved	ug/L	<1.1	1000	1000	929	917	93	92	75-125	1	20		
Potassium, Dissolved	ug/L	1280J	20000	20000	20500	20100	96	94	75-125	2	20		
Selenium, Dissolved	ug/L	<6.4	1000	1000	987	961	99	96	75-125	3	20		
Silver, Dissolved	ug/L	<0.27	500	500	456	451	91	90	75-125	1	20		
Sodium, Dissolved	ug/L	13000	20000	20000	32000	31400	95	92	75-125	2	20		
Thallium, Dissolved	ug/L	9.8J	1000	1000	942	925	93	92	75-125	2	20		
Vanadium, Dissolved	ug/L	5.0J	1000	1000	903	891	90	89	75-125	1	20		
Zinc, Dissolved	ug/L	186	1000	1000	1110	1100	93	92	75-125	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796137 2796138

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407002 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	<8.6	20000	20000	19900	19800	99	99	75-125	0	20		
Antimony, Dissolved	ug/L	<3.1	1000	1000	944	949	94	95	75-125	1	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Parameter	Units	2796137		2796138		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Arsenic, Dissolved	ug/L	<5.2	1000	1000	941	933	94	93	75-125	1	20	
Barium, Dissolved	ug/L	29.1	1000	1000	976	971	95	94	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	967	960	97	96	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	927	920	93	92	75-125	1	20	
Calcium, Dissolved	ug/L	45400	20000	20000	63400	63100	90	88	75-125	1	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	939	933	94	93	75-125	1	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	913	910	91	91	75-125	0	20	
Copper, Dissolved	ug/L	29.3	1000	1000	934	932	90	90	75-125	0	20	
Iron, Dissolved	ug/L	<16.7	20000	20000	18500	18400	93	92	75-125	0	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	928	923	93	92	75-125	1	20	
Magnesium, Dissolved	ug/L	12900	20000	20000	31300	31200	92	92	75-125	0	20	
Manganese, Dissolved	ug/L	<0.38	1000	1000	943	938	94	94	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	921	915	92	91	75-125	1	20	
Potassium, Dissolved	ug/L	1340J	20000	20000	20300	20300	95	95	75-125	0	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	978	976	98	98	75-125	0	20	
Silver, Dissolved	ug/L	<0.27	500	500	453	450	91	90	75-125	1	20	
Sodium, Dissolved	ug/L	11900	20000	20000	30500	30400	93	92	75-125	0	20	
Thallium, Dissolved	ug/L	4.9J	1000	1000	936	929	93	92	75-125	1	20	
Vanadium, Dissolved	ug/L	7.9J	1000	1000	895	890	89	88	75-125	1	20	
Zinc, Dissolved	ug/L	45.3	1000	1000	971	960	93	91	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414596

QC Batch: 514454 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10414596001

METHOD BLANK: 2797605 Matrix: Water  
Associated Lab Samples: 10414596001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	12/19/17 10:28	

LABORATORY CONTROL SAMPLE & LCSD: 2797606 2797607

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	39.1	38.6	98	96	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2797608 2797609

Parameter	Units	10414343003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	337	40	40	375	372	95	88	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2797610 2797611

Parameter	Units	10414554006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	274	40	40	320	328	114	133	80-120	2	30	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch:	514949	Analysis Method:	SM 2320B
QC Batch Method:	SM 2320B	Analysis Description:	2320B Alkalinity
Associated Lab Samples:	10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009		

METHOD BLANK:	2800157	Matrix:	Water
Associated Lab Samples:	10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	12/21/17 13:21	

LABORATORY CONTROL SAMPLE & LCSD: 2800158		2800159									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Alkalinity, Total as CaCO3	mg/L	40	40.2	37.9	101	95	90-110	6	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2800160		2800161										
Parameter	Units	10414988005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	207	40	40	244	245	92	95	80-120	0	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2800162		2800163										
Parameter	Units	10414961004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	133	40	40	167	169	84	91	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 514694

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 2799013

Matrix: Water

Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/20/17 13:22	

LABORATORY CONTROL SAMPLE: 2799014

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	974	97	80-120	

SAMPLE DUPLICATE: 2799015

Parameter	Units	10414554004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1610	1610	0	10	

SAMPLE DUPLICATE: 2799016

Parameter	Units	10414554005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	540	542	0	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 97199 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 418254 Matrix: Water  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/19/17 12:03	

LABORATORY CONTROL SAMPLE: 418255

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	97	90-110	

MATRIX SPIKE SAMPLE: 418257

Parameter	Units	2067205001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.027	14	75-125	M1

SAMPLE DUPLICATE: 418256

Parameter	Units	2067205001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 513963 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 2795015 Matrix: Water  
 Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	12/15/17 15:40	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/15/17 15:40	
Sulfate	mg/L	<0.27	1.2	0.27	12/15/17 15:40	

LABORATORY CONTROL SAMPLE: 2795016

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	
Nitrate as N	mg/L	1	0.97	97	90-110	
Sulfate	mg/L	12.5	12.7	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795017 2795018

Parameter	Units	10414596001		2795017		2795018		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Chloride	mg/L	1.6	12.5	12.5	13.7	12.5	97	88	90-110	9	20	M1		
Nitrate as N	mg/L	0.089J	1	1	1.0	0.95	96	86	90-110	10	20	M1		
Sulfate	mg/L	1.8	12.5	12.5	14.3	12.9	100	89	90-110	10	20	M1		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795019 2795020

Parameter	Units	10414596002		2795019		2795020		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Chloride	mg/L	42.3	12.5	12.5	45.7	45.9	28	29	90-110	0	20	M1		
Nitrate as N	mg/L	5.9	1	1	5.7	5.7	-20	-18	90-110	0	20	M1		
Sulfate	mg/L	40.8	12.5	12.5	44.8	45.0	32	34	90-110	0	20	M1		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414596

QC Batch: 515347 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 2802262 Matrix: Water  
Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 13:41	

LABORATORY CONTROL SAMPLE: 2802263

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802264 2802265

Parameter	Units	10414407002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	4.2	5	5	9.3	9.0	101	95	90-110	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802266 2802267

Parameter	Units	10414496003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	1.1	1.0	97	93	90-110	4	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch: 514212

Analysis Method: EPA 410.4

QC Batch Method: EPA 410.4

Analysis Description: 410.4 COD

Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

METHOD BLANK: 2796404

Matrix: Water

Associated Lab Samples: 10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	12/18/17 14:11	

LABORATORY CONTROL SAMPLE: 2796405

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	306	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796406 2796407

Parameter	Units	10414657001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	ND	250	250	256	260	102	104	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796408 2796409

Parameter	Units	10414657002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	ND	250	250	259	272	104	109	90-110	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

QC Batch:	133836	Analysis Method:	SM 5310C
QC Batch Method:	SM 5310C	Analysis Description:	5310C TOC
Associated Lab Samples:	10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009		

METHOD BLANK:	533287	Matrix:	Water
Associated Lab Samples:	10414596001, 10414596002, 10414596003, 10414596004, 10414596005, 10414596006, 10414596007, 10414596008, 10414596009		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	12/20/17 21:45	

LABORATORY CONTROL SAMPLE: 533288						
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.9	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 533289												533290	
Parameter	Units	10414329001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Total Organic Carbon	mg/L	3.8	25	25	29.6	29.5	103	103	80-120	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 533291												533292	
Parameter	Units	10414385001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Total Organic Carbon	mg/L	2.0J	25	25	27.1	27.5	101	102	80-120	1	20		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414596

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414596001	MW-6s	RSK 175	514438		
10414596002	MW-12s	RSK 175	514438		
10414596003	MW-11s	RSK 175	514438		
10414596004	MW-10s	RSK 175	514438		
10414596005	MW-7s	RSK 175	514438		
10414596006	MW-8s	RSK 175	514438		
10414596007	MW-9s	RSK 175	514687		
10414596008	MW-21d	RSK 175	514687		
10414596009	MW-20d	RSK 175	514687		
10414596001	MW-6s	EPA 3010	514108	6010C Met	515071
10414596002	MW-12s	EPA 3010	514108	6010C Met	515071
10414596003	MW-11s	EPA 3010	514108	6010C Met	515071
10414596004	MW-10s	EPA 3010	514108	6010C Met	515071
10414596005	MW-7s	EPA 3010	514108	6010C Met	515071
10414596006	MW-8s	EPA 3010	514108	6010C Met	515071
10414596007	MW-9s	EPA 3010	514108	6010C Met	515071
10414596008	MW-21d	EPA 3010	514108	6010C Met	515071
10414596009	MW-20d	EPA 3010	514108	6010C Met	515071
10414596001	MW-6s	EPA 7470A	514122	EPA 7470A	515039
10414596002	MW-12s	EPA 7470A	514122	EPA 7470A	515039
10414596003	MW-11s	EPA 7470A	514122	EPA 7470A	515039
10414596004	MW-10s	EPA 7470A	514122	EPA 7470A	515039
10414596005	MW-7s	EPA 7470A	514122	EPA 7470A	515039
10414596006	MW-8s	EPA 7470A	514122	EPA 7470A	515039
10414596007	MW-9s	EPA 7470A	514122	EPA 7470A	515039
10414596008	MW-21d	EPA 7470A	514122	EPA 7470A	515039
10414596009	MW-20d	EPA 7470A	514122	EPA 7470A	515039
10414596001	MW-6s	SM 2320B	514454		
10414596002	MW-12s	SM 2320B	514949		
10414596003	MW-11s	SM 2320B	514949		
10414596004	MW-10s	SM 2320B	514949		
10414596005	MW-7s	SM 2320B	514949		
10414596006	MW-8s	SM 2320B	514949		
10414596007	MW-9s	SM 2320B	514949		
10414596008	MW-21d	SM 2320B	514949		
10414596009	MW-20d	SM 2320B	514949		
10414596001	MW-6s	SM 2540C	514694		
10414596002	MW-12s	SM 2540C	514694		
10414596003	MW-11s	SM 2540C	514694		
10414596004	MW-10s	SM 2540C	514694		
10414596005	MW-7s	SM 2540C	514694		
10414596006	MW-8s	SM 2540C	514694		
10414596007	MW-9s	SM 2540C	514694		
10414596008	MW-21d	SM 2540C	514694		
10414596009	MW-20d	SM 2540C	514694		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414596

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414596001	MW-6s	SM 4500-S-2 D	97199		
10414596002	MW-12s	SM 4500-S-2 D	97199		
10414596003	MW-11s	SM 4500-S-2 D	97199		
10414596004	MW-10s	SM 4500-S-2 D	97199		
10414596005	MW-7s	SM 4500-S-2 D	97199		
10414596006	MW-8s	SM 4500-S-2 D	97199		
10414596007	MW-9s	SM 4500-S-2 D	97199		
10414596008	MW-21d	SM 4500-S-2 D	97199		
10414596009	MW-20d	SM 4500-S-2 D	97199		
10414596001	MW-6s	EPA 300.0	513963		
10414596002	MW-12s	EPA 300.0	513963		
10414596003	MW-11s	EPA 300.0	513963		
10414596004	MW-10s	EPA 300.0	513963		
10414596005	MW-7s	EPA 300.0	513963		
10414596006	MW-8s	EPA 300.0	513963		
10414596007	MW-9s	EPA 300.0	513963		
10414596008	MW-21d	EPA 300.0	513963		
10414596009	MW-20d	EPA 300.0	513963		
10414596001	MW-6s	EPA 353.2	515347		
10414596002	MW-12s	EPA 353.2	515347		
10414596003	MW-11s	EPA 353.2	515347		
10414596004	MW-10s	EPA 353.2	515347		
10414596005	MW-7s	EPA 353.2	515347		
10414596006	MW-8s	EPA 353.2	515347		
10414596007	MW-9s	EPA 353.2	515347		
10414596008	MW-21d	EPA 353.2	515347		
10414596009	MW-20d	EPA 353.2	515347		
10414596001	MW-6s	EPA 410.4	514212	EPA 410.4	514345
10414596002	MW-12s	EPA 410.4	514212	EPA 410.4	514345
10414596003	MW-11s	EPA 410.4	514212	EPA 410.4	514345
10414596004	MW-10s	EPA 410.4	514212	EPA 410.4	514345
10414596005	MW-7s	EPA 410.4	514212	EPA 410.4	514345
10414596006	MW-8s	EPA 410.4	514212	EPA 410.4	514345
10414596007	MW-9s	EPA 410.4	514212	EPA 410.4	514345
10414596008	MW-21d	EPA 410.4	514212	EPA 410.4	514345
10414596009	MW-20d	EPA 410.4	514212	EPA 410.4	514345
10414596001	MW-6s	SM 5310C	133836		
10414596002	MW-12s	SM 5310C	133836		
10414596003	MW-11s	SM 5310C	133836		
10414596004	MW-10s	SM 5310C	133836		
10414596005	MW-7s	SM 5310C	133836		
10414596006	MW-8s	SM 5310C	133836		
10414596007	MW-9s	SM 5310C	133836		
10414596008	MW-21d	SM 5310C	133836		
10414596009	MW-20d	SM 5310C	133836		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10/11/596

**Section A**  
Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email:  
 Phone: Fax:  
 Requested Due Date: **10 Day Standard**

**Section B**  
Required Project Information:

Report To: Mark Ochsner, Brad Ostapowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # PEDD# 1497-39-Rev1  
 Project Name: Freeman WA-Grain Handling Facility  
 Project #: 1497

**Section C**  
Invoice Information:

Attention: Anne Walsh  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447

Page: 1 of 1

ITEM #	SAMPLE ID <small>One Character per box. (A-Z, 0-9 /, -) Sample Ids must be unique</small>	MATRIX Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					ANALYSES TEST	Requested Analysis/Filtered (Y/N)																								
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate		Other	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2														
1	MW-05	WT	G	12/14	815	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	001
2	MW-12S	WT	G	12/14	900	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	002	
3	MW-11S	WT	G	12/14	920	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	003	
4	MW-10S	WT	G	12/14	950	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	004	
5	MW-7S	WT	G	12/14	1020	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	005	
6	MW-1S	WT	G	12/14	1105	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	006	
7	MW-8S	WT	G	12/14	1120	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	007	
8	MW-9S	WT	G	12/14	1145	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	008	
9	MW-21d	WT	G	12/14	1335	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	009	
10	MW-20d	WT	G	12/14	1500	-	-	-	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	009
11	<del>Frip Blank</del>	WT	G	12/14	-	-	-	-	2																																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	John G. CH2M	12/14/17		[Signature] UPRR	12-15-17	945	5.8	✓	✓	✓
*Field filtered by client							5.6			

SAMPLER NAME AND SIGNATURE		TEMP IN C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <u>Jonathan Espinoza</u>	SIGNATURE of SAMPLER: <u>[Signature]</u>	DATE Signed: <u>12/14/17</u>				

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** ARM Hill **Project #:** WO# : 10414596

**WO# : 10414596**



**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

**Tracking Number:** 7475 9036 4430/41

**Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No  
**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: PB **Temp Blank?**  Yes  No  
**Thermometer**  151401163  G87A9155100842 **Type of Ice:**  Wet  Blue  None  Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 5.7, 5.5 **Cooler Temp Corrected (°C):** 5.8, 5.6 **Biological Tissue Frozen?**  Yes  No  NA  
 Temp should be above freezing to 6°C **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** GM 12-15-17

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>No MS/MSD</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. <u>Did not receive sample MW-15</u>
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N zinc
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # 1-5,7-10: 1/1 1/1 1/1
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: Lindsey

Field Data Required?  Yes  No

Date/Time: 12/15/17

Comments/Resolution: Notified client of missing sample.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1140</u>	Temp: <u>5.75</u>	Corrected Temp: <u>5.8 5.6</u>
Time: <u>1200</u>	put in cooler: <u>5.5</u>	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:**

Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers)

JENNI GROSS

Date: 12/15/17

rm will be sent to the North Carolina DEHNR Certification Office (i.e. out of

Chain of Custody

WO#: 2067180



Workorder: 10414596      Workorder Name: 1497 Freeman WA-Grain Handling      Owner Received Date: 12/15/2017      Results Requested By: 1/2/2018

Report To		Subcontract To					Requested Analysis																									
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																									
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other											LAB USE ONLY															
1	MW-6s	PS	12/14/2017 08:15	10414596001	Water	1											X															
2	MW-12s	PS	12/14/2017 09:00	10414596002	Water	1											X															
3	MW-11s	PS	12/14/2017 09:20	10414596003	Water	1											X															
4	MW-10s	PS	12/14/2017 09:50	10414596004	Water	1											X															
5	MW-7s	PS	12/14/2017 10:20	10414596005	Water	1											X															
6	MW-8s	PS	12/14/2017 11:20	10414596006	Water	1											X															
7	MW-9s	PS	12/14/2017 11:45	10414596007	Water	1											X															
8	MW-21d	PS	12/14/2017 13:35	10414596008	Water	1											X															
9	MW-20d	PS	12/14/2017 15:00	10414596009	Water	1	X																									
Transfers		Released By	Date/Time	Received By		Date/Time		Comments																								
1		FedEx	12/15/17 16:20	[Signature]		12/14/17 8:30																										
2			12/14/17 8:30			12/14/17 8:30																										
3																																
Cooler Temperature on Receipt		1.7°C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact										Y or N													

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

WO#: 2067180

PM: CMM Due Date: 01/03/18

CLIENT: PASI-MINN

F



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Sample Condition Upc

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:

- Therm Fisher IR 5
- Therm Fisher IR 6
- Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12-16-17 AB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present??	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Chain of Custody

WO#: 12102628

PM: HRZ Due Date: 01/03/18  
 CLIENT: Pace WA

Page 6 of 61

Workorder: 10414596 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 12/15/2017 Results Requested By: 1/2/2018

Report To		Subcontract To				Requested Analysis														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																		
							Preserved Containers													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H <sub>2</sub> SO <sub>4</sub>														LAB USE ONLY
1	MW-6s	PS	12/14/2017 08:15	10414596001	Water	1														
2	MW-12s	PS	12/14/2017 09:00	10414596002	Water	1														
3	MW-11s	PS	12/14/2017 09:20	10414596003	Water	1														
4	MW-10s	PS	12/14/2017 09:50	10414596004	Water	1														
5	MW-7s	PS	12/14/2017 10:20	10414596005	Water	1														
6	MW-8s	PS	12/14/2017 11:20	10414596006	Water	1														
7	MW-9s	PS	12/14/2017 11:45	10414596007	Water	1														
8	MW-21d	PS	12/14/2017 13:35	10414596008	Water	1														
9	MW-20d	PS	12/14/2017 15:00	10414596009	Water	1														

5632354 / 5310 TOC

					Comments
Transfers	Released By	Date/Time	Received By	Date/Time	
1	<i>[Signature]</i>	12/15/17 17:00	<i>[Signature]</i>	12-15-18:30	
2	<i>[Signature]</i>	12/15 22:10	<i>[Signature]</i>	12/18/17 08:00	
3					

Cooler Temperature on Receipt 0.4 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MN Project #: \_\_\_\_\_

**WO#: 12102628**

PM: HRZ Due Date: 01/03/18  
CLIENT: Pace WA

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.1 Cooler Temp Corrected °C: 0.4 Biological Tissue Frozen?  Yes  No  NA  
Temp should be above freezing to 6°C Correction Factor: -0.3 Date and Initials of Person Examining Contents: 12-15-17 JCS

Comments: M 12/18/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 12/18/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

January 02, 2018

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

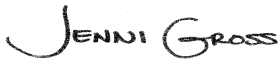
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414755001	MW-14d-GW-121517	Water	12/15/17 10:25	12/16/17 09:35
10414755002	MW-18d-GW-121517	Water	12/15/17 11:35	12/16/17 09:35
10414755003	MW-4d-GW-121517	Water	12/15/17 13:25	12/16/17 09:35

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414755001	MW-14d-GW-121517	RSK 175	MLS	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414755002	MW-18d-GW-121517	RSK 175	MLS	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10414755003	MW-4d-GW-121517	RSK 175	MLS	3	PASI-M
		6010C Met	BD1	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414755001</b>	<b>MW-14d-GW-121517</b>					
RSK 175	Methane	3.6J	ug/L	10.0	12/21/17 09:43	
6010C Met	Aluminum, Dissolved	90.9J	ug/L	200	12/27/17 22:08	
6010C Met	Barium, Dissolved	25.9	ug/L	10.0	12/27/17 22:08	
6010C Met	Calcium, Dissolved	27000	ug/L	500	12/27/17 22:08	
6010C Met	Iron, Dissolved	345	ug/L	50.0	12/27/17 22:08	
6010C Met	Magnesium, Dissolved	8150	ug/L	500	12/27/17 22:08	
6010C Met	Manganese, Dissolved	436	ug/L	5.0	12/27/17 22:08	
6010C Met	Potassium, Dissolved	358J	ug/L	2500	12/27/17 22:08	
6010C Met	Sodium, Dissolved	23600	ug/L	1000	12/27/17 22:08	
6010C Met	Vanadium, Dissolved	5.2J	ug/L	15.0	12/27/17 22:08	
6010C Met	Zinc, Dissolved	2.2J	ug/L	20.0	12/27/17 22:08	
EPA 7470A	Mercury, Dissolved	0.066J	ug/L	0.20	12/27/17 17:48	
SM 2320B	Alkalinity, Total as CaCO3	142	mg/L	5.0	12/22/17 11:14	
SM 2540C	Total Dissolved Solids	245	mg/L	10.0	12/21/17 16:06	
EPA 300.0	Chloride	1.9	mg/L	1.2	12/16/17 11:58	
EPA 300.0	Nitrate as N	0.073J	mg/L	0.10	12/16/17 11:58	
EPA 300.0	Sulfate	14.1	mg/L	1.2	12/16/17 11:58	M1
EPA 353.2	Nitrogen, NO2 plus NO3	0.066	mg/L	0.020	12/23/17 13:39	
SM 5310C	Total Organic Carbon	3.5	mg/L	1.0	12/29/17 17:15	
<b>10414755002</b>	<b>MW-18d-GW-121517</b>					
RSK 175	Methane	5.3J	ug/L	10.0	12/21/17 09:50	
6010C Met	Barium, Dissolved	49.0	ug/L	10.0	12/27/17 22:12	
6010C Met	Calcium, Dissolved	20500	ug/L	500	12/27/17 22:12	
6010C Met	Iron, Dissolved	74.2	ug/L	50.0	12/27/17 22:12	
6010C Met	Magnesium, Dissolved	14300	ug/L	500	12/27/17 22:12	
6010C Met	Manganese, Dissolved	48.5	ug/L	5.0	12/27/17 22:12	
6010C Met	Potassium, Dissolved	3570	ug/L	2500	12/27/17 22:12	
6010C Met	Sodium, Dissolved	18700	ug/L	1000	12/27/17 22:12	
6010C Met	Zinc, Dissolved	2.1J	ug/L	20.0	12/27/17 22:12	
SM 2320B	Alkalinity, Total as CaCO3	153	mg/L	5.0	12/22/17 11:18	
SM 2540C	Total Dissolved Solids	203	mg/L	10.0	12/21/17 16:06	
EPA 300.0	Chloride	2.7	mg/L	1.2	12/16/17 13:01	
EPA 300.0	Sulfate	8.3	mg/L	1.2	12/16/17 13:01	
SM 5310C	Total Organic Carbon	0.64J	mg/L	1.0	12/29/17 17:29	
<b>10414755003</b>	<b>MW-4d-GW-121517</b>					
RSK 175	Methane	3.4J	ug/L	10.0	12/21/17 09:58	
6010C Met	Aluminum, Dissolved	30.0J	ug/L	200	12/27/17 22:16	
6010C Met	Barium, Dissolved	45.2	ug/L	10.0	12/27/17 22:16	
6010C Met	Calcium, Dissolved	36400	ug/L	500	12/27/17 22:16	
6010C Met	Copper, Dissolved	0.85J	ug/L	10.0	12/27/17 22:16	
6010C Met	Iron, Dissolved	38.0J	ug/L	50.0	12/27/17 22:16	
6010C Met	Magnesium, Dissolved	12300	ug/L	500	12/27/17 22:16	
6010C Met	Manganese, Dissolved	3.5J	ug/L	5.0	12/27/17 22:16	
6010C Met	Potassium, Dissolved	2700	ug/L	2500	12/27/17 22:16	
6010C Met	Sodium, Dissolved	18000	ug/L	1000	12/27/17 22:16	
6010C Met	Vanadium, Dissolved	9.7J	ug/L	15.0	12/27/17 22:16	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414755003</b>	<b>MW-4d-GW-121517</b>					
6010C Met	Zinc, Dissolved	13.4J	ug/L	20.0	12/27/17 22:16	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	170	mg/L	5.0	12/22/17 11:22	
SM 2540C	Total Dissolved Solids	266	mg/L	10.0	12/21/17 16:06	
SM 4500-S-2 D	Sulfide, Total	0.0050J	mg/L	0.020	12/20/17 15:27	
EPA 300.0	Chloride	5.3	mg/L	1.2	12/16/17 13:16	
EPA 300.0	Nitrate as N	1.7	mg/L	0.10	12/16/17 13:16	
EPA 300.0	Sulfate	13.3	mg/L	1.2	12/16/17 13:16	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	1.7	mg/L	0.020	12/23/17 13:44	
SM 5310C	Total Organic Carbon	0.93J	mg/L	1.0	12/29/17 17:43	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 514904

R1: RPD value was outside control limits.

- DUP (Lab ID: 2800034)
- Methane

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515183

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414961001,10414961016

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2801395)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2801398)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 97371

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 2067367001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 419096)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 514053

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414755001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2795706)
  - Sulfate
- MSD (Lab ID: 2795707)
  - Sulfate

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515348

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414755003,10415446001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2802272)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802273)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

Analyte Comments:

QC Batch: 515348

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2802270)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802271)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 02, 2018

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

**Sample: MW-14d-GW-121517**      **Lab ID: 10414755001**      Collected: 12/15/17 10:25      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/21/17 09:43	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/21/17 09:43	74-85-1	
Methane	3.6J	ug/L	10.0	1.1	1		12/21/17 09:43	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	90.9J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 22:08	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 22:08	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 22:08	7440-38-2	
Barium, Dissolved	25.9	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 22:08	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 22:08	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 22:08	7440-43-9	
Calcium, Dissolved	27000	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 22:08	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 22:08	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 22:08	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 22:08	7440-50-8	
Iron, Dissolved	345	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 22:08	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 22:08	7439-92-1	
Magnesium, Dissolved	8150	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 22:08	7439-95-4	
Manganese, Dissolved	436	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 22:08	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 22:08	7440-02-0	
Potassium, Dissolved	358J	ug/L	2500	126	1	12/21/17 13:52	12/27/17 22:08	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 22:08	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 22:08	7440-22-4	
Sodium, Dissolved	23600	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 22:08	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 22:08	7440-28-0	
Vanadium, Dissolved	5.2J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 22:08	7440-62-2	
Zinc, Dissolved	2.2J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 22:08	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	0.066J	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:48	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	142	mg/L	5.0	1.4	1		12/22/17 11:14		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	245	mg/L	10.0	5.0	1		12/21/17 16:06		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/20/17 15:26	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.9	mg/L	1.2	0.14	1		12/16/17 11:58	16887-00-6	
Nitrate as N	0.073J	mg/L	0.10	0.0079	1		12/16/17 11:58	14797-55-8	
Sulfate	14.1	mg/L	1.2	0.27	1		12/16/17 11:58	14808-79-8	M1

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Sample: MW-14d-GW-121517**      **Lab ID: 10414755001**      Collected: 12/15/17 10:25      Received: 12/16/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.066</b>	mg/L	0.020	0.0075	1		12/23/17 13:39		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:17		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>3.5</b>	mg/L	1.0	0.20	1		12/29/17 17:15	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

**Sample: MW-18d-GW-121517**      **Lab ID: 10414755002**      Collected: 12/15/17 11:35      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/21/17 09:50	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/21/17 09:50	74-85-1	
Methane	5.3J	ug/L	10.0	1.1	1		12/21/17 09:50	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 22:12	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 22:12	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 22:12	7440-38-2	
Barium, Dissolved	49.0	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 22:12	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 22:12	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 22:12	7440-43-9	
Calcium, Dissolved	20500	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 22:12	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 22:12	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 22:12	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 22:12	7440-50-8	
Iron, Dissolved	74.2	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 22:12	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 22:12	7439-92-1	
Magnesium, Dissolved	14300	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 22:12	7439-95-4	
Manganese, Dissolved	48.5	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 22:12	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 22:12	7440-02-0	
Potassium, Dissolved	3570	ug/L	2500	126	1	12/21/17 13:52	12/27/17 22:12	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 22:12	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 22:12	7440-22-4	
Sodium, Dissolved	18700	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 22:12	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 22:12	7440-28-0	
Vanadium, Dissolved	<0.42	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 22:12	7440-62-2	
Zinc, Dissolved	2.1J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 22:12	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:50	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	153	mg/L	5.0	1.4	1		12/22/17 11:18		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	203	mg/L	10.0	5.0	1		12/21/17 16:06		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/20/17 15:27	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.7	mg/L	1.2	0.14	1		12/16/17 13:01	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		12/16/17 13:01	14797-55-8	
Sulfate	8.3	mg/L	1.2	0.27	1		12/16/17 13:01	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Sample: MW-18d-GW-121517**      **Lab ID: 10414755002**      Collected: 12/15/17 11:35      Received: 12/16/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		12/23/17 13:40		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:17		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.64J</b>	mg/L	1.0	0.20	1		12/29/17 17:29	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

**Sample: MW-4d-GW-121517**      **Lab ID: 10414755003**      Collected: 12/15/17 13:25      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/21/17 09:58	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/21/17 09:58	74-85-1	
Methane	3.4J	ug/L	10.0	1.1	1		12/21/17 09:58	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	30.0J	ug/L	200	8.6	1	12/21/17 13:52	12/27/17 22:16	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/21/17 13:52	12/27/17 22:16	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/21/17 13:52	12/27/17 22:16	7440-38-2	
Barium, Dissolved	45.2	ug/L	10.0	0.22	1	12/21/17 13:52	12/27/17 22:16	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/21/17 13:52	12/27/17 22:16	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/21/17 13:52	12/27/17 22:16	7440-43-9	
Calcium, Dissolved	36400	ug/L	500	24.7	1	12/21/17 13:52	12/27/17 22:16	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/21/17 13:52	12/27/17 22:16	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/21/17 13:52	12/27/17 22:16	7440-48-4	
Copper, Dissolved	0.85J	ug/L	10.0	0.83	1	12/21/17 13:52	12/27/17 22:16	7440-50-8	
Iron, Dissolved	38.0J	ug/L	50.0	16.7	1	12/21/17 13:52	12/27/17 22:16	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	12/21/17 13:52	12/27/17 22:16	7439-92-1	
Magnesium, Dissolved	12300	ug/L	500	2.6	1	12/21/17 13:52	12/27/17 22:16	7439-95-4	
Manganese, Dissolved	3.5J	ug/L	5.0	0.38	1	12/21/17 13:52	12/27/17 22:16	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/21/17 13:52	12/27/17 22:16	7440-02-0	
Potassium, Dissolved	2700	ug/L	2500	126	1	12/21/17 13:52	12/27/17 22:16	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/21/17 13:52	12/27/17 22:16	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/21/17 13:52	12/27/17 22:16	7440-22-4	
Sodium, Dissolved	18000	ug/L	1000	44.6	1	12/21/17 13:52	12/27/17 22:16	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	12/21/17 13:52	12/27/17 22:16	7440-28-0	
Vanadium, Dissolved	9.7J	ug/L	15.0	0.42	1	12/21/17 13:52	12/27/17 22:16	7440-62-2	
Zinc, Dissolved	13.4J	ug/L	20.0	1.8	1	12/21/17 13:52	12/27/17 22:16	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/21/17 12:02	12/27/17 17:52	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	170	mg/L	5.0	1.4	1		12/22/17 11:22		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	266	mg/L	10.0	5.0	1		12/21/17 16:06		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0050J	mg/L	0.020	0.0050	1		12/20/17 15:27	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	5.3	mg/L	1.2	0.14	1		12/16/17 13:16	16887-00-6	
Nitrate as N	1.7	mg/L	0.10	0.0079	1		12/16/17 13:16	14797-55-8	
Sulfate	13.3	mg/L	1.2	0.27	1		12/16/17 13:16	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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**Sample: MW-4d-GW-121517**      **Lab ID: 10414755003**      Collected: 12/15/17 13:25      Received: 12/16/17 09:35      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>1.7</b>	mg/L	0.020	0.0075	1		12/23/17 13:44		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	12/18/17 10:28	12/18/17 14:17		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.93J</b>	mg/L	1.0	0.20	1		12/29/17 17:43	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

QC Batch: 514904 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2800031 Matrix: Water  
Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/21/17 09:01	
Ethene	ug/L	<0.68	10.0	0.68	12/21/17 09:01	
Methane	ug/L	4.2J	10.0	1.1	12/21/17 09:01	

LABORATORY CONTROL SAMPLE & LCSD: 2800032

Parameter	Units	2800033								
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	109	100	96	88	85-115	8	20	
Ethene	ug/L	106	102	94.8	97	89	85-115	8	20	
Methane	ug/L	60.7	60.1	58.2	99	96	85-115	3	20	

SAMPLE DUPLICATE: 2800034

Parameter	Units	10414911008		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	280	406	37	20 R1	

SAMPLE DUPLICATE: 2800035

Parameter	Units	10414911019		RPD	Max RPD	Qualifiers
		Result	Dup Result			
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	ND	5.8J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

QC Batch: 514122

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2796191

Matrix: Water

Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	12/27/17 16:55	

LABORATORY CONTROL SAMPLE: 2796192

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796193 2796194

Parameter	Units	10414407001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Mercury, Dissolved	ug/L	<0.062	5	5.4	5	5.6	107	112	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796195 2796196

Parameter	Units	10414407002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Mercury, Dissolved	ug/L	<0.062	5	5.2	5	5.4	105	108	80-120	3	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

QC Batch: 514108 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2796133 Matrix: Water  
Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	12/27/17 20:24	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	12/27/17 20:24	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	12/27/17 20:24	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	12/27/17 20:24	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	12/27/17 20:24	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	12/27/17 20:24	
Calcium, Dissolved	ug/L	<24.7	500	24.7	12/27/17 20:24	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	12/27/17 20:24	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	12/27/17 20:24	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	12/27/17 20:24	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	12/27/17 20:24	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	12/27/17 20:24	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	12/27/17 20:24	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	12/27/17 20:24	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	12/27/17 20:24	
Potassium, Dissolved	ug/L	<126	2500	126	12/27/17 20:24	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	12/27/17 20:24	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	12/27/17 20:24	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	12/27/17 20:24	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	12/27/17 20:24	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	12/27/17 20:24	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	12/27/17 20:24	

LABORATORY CONTROL SAMPLE: 2796134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19500	97	80-120	
Antimony, Dissolved	ug/L	1000	939	94	80-120	
Arsenic, Dissolved	ug/L	1000	916	92	80-120	
Barium, Dissolved	ug/L	1000	930	93	80-120	
Beryllium, Dissolved	ug/L	1000	943	94	80-120	
Cadmium, Dissolved	ug/L	1000	911	91	80-120	
Calcium, Dissolved	ug/L	20000	17600	88	80-120	
Chromium, Dissolved	ug/L	1000	922	92	80-120	
Cobalt, Dissolved	ug/L	1000	916	92	80-120	
Copper, Dissolved	ug/L	1000	885	88	80-120	
Iron, Dissolved	ug/L	20000	18200	91	80-120	
Lead, Dissolved	ug/L	1000	924	92	80-120	
Magnesium, Dissolved	ug/L	20000	17900	89	80-120	
Manganese, Dissolved	ug/L	1000	934	93	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

LABORATORY CONTROL SAMPLE: 2796134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	927	93	80-120	
Potassium, Dissolved	ug/L	20000	18000	90	80-120	
Selenium, Dissolved	ug/L	1000	972	97	80-120	
Silver, Dissolved	ug/L	500	443	89	80-120	
Sodium, Dissolved	ug/L	20000	18100	91	80-120	
Thallium, Dissolved	ug/L	1000	909	91	80-120	
Vanadium, Dissolved	ug/L	1000	874	87	80-120	
Zinc, Dissolved	ug/L	1000	933	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796135 2796136

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	<8.6	20000	20000	20200	19700	101	99	75-125	2	20		
Antimony, Dissolved	ug/L	<3.1	1000	1000	974	954	97	95	75-125	2	20		
Arsenic, Dissolved	ug/L	<5.2	1000	1000	947	935	95	94	75-125	1	20		
Barium, Dissolved	ug/L	20.5	1000	1000	976	961	96	94	75-125	2	20		
Beryllium, Dissolved	ug/L	<0.11	1000	1000	970	959	97	96	75-125	1	20		
Cadmium, Dissolved	ug/L	<0.46	1000	1000	934	920	93	92	75-125	2	20		
Calcium, Dissolved	ug/L	41800	20000	20000	60800	60400	95	93	75-125	1	20		
Chromium, Dissolved	ug/L	<0.50	1000	1000	944	932	94	93	75-125	1	20		
Cobalt, Dissolved	ug/L	<1.1	1000	1000	924	910	92	91	75-125	2	20		
Copper, Dissolved	ug/L	11.1	1000	1000	927	912	92	90	75-125	2	20		
Iron, Dissolved	ug/L	<16.7	20000	20000	18800	18400	94	92	75-125	2	20		
Lead, Dissolved	ug/L	<3.0	1000	1000	937	925	94	92	75-125	1	20		
Magnesium, Dissolved	ug/L	13000	20000	20000	31900	31600	95	93	75-125	1	20		
Manganese, Dissolved	ug/L	1.1J	1000	1000	952	939	95	94	75-125	1	20		
Nickel, Dissolved	ug/L	<1.1	1000	1000	929	917	93	92	75-125	1	20		
Potassium, Dissolved	ug/L	1280J	20000	20000	20500	20100	96	94	75-125	2	20		
Selenium, Dissolved	ug/L	<6.4	1000	1000	987	961	99	96	75-125	3	20		
Silver, Dissolved	ug/L	<0.27	500	500	456	451	91	90	75-125	1	20		
Sodium, Dissolved	ug/L	13000	20000	20000	32000	31400	95	92	75-125	2	20		
Thallium, Dissolved	ug/L	9.8J	1000	1000	942	925	93	92	75-125	2	20		
Vanadium, Dissolved	ug/L	5.0J	1000	1000	903	891	90	89	75-125	1	20		
Zinc, Dissolved	ug/L	186	1000	1000	1110	1100	93	92	75-125	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796137 2796138

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10414407002 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	<8.6	20000	20000	19900	19800	99	99	75-125	0	20		
Antimony, Dissolved	ug/L	<3.1	1000	1000	944	949	94	95	75-125	1	20		
Arsenic, Dissolved	ug/L	<5.2	1000	1000	941	933	94	93	75-125	1	20		
Barium, Dissolved	ug/L	29.1	1000	1000	976	971	95	94	75-125	1	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796137		2796138		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10414407002 Result	MS Spike Conc.	MSD Spike Conc.								
Beryllium, Dissolved	ug/L	<0.11	1000	1000	967	960	97	96	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	927	920	93	92	75-125	1	20	
Calcium, Dissolved	ug/L	45400	20000	20000	63400	63100	90	88	75-125	1	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	939	933	94	93	75-125	1	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	913	910	91	91	75-125	0	20	
Copper, Dissolved	ug/L	29.3	1000	1000	934	932	90	90	75-125	0	20	
Iron, Dissolved	ug/L	<16.7	20000	20000	18500	18400	93	92	75-125	0	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	928	923	93	92	75-125	1	20	
Magnesium, Dissolved	ug/L	12900	20000	20000	31300	31200	92	92	75-125	0	20	
Manganese, Dissolved	ug/L	<0.38	1000	1000	943	938	94	94	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	921	915	92	91	75-125	1	20	
Potassium, Dissolved	ug/L	1340J	20000	20000	20300	20300	95	95	75-125	0	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	978	976	98	98	75-125	0	20	
Silver, Dissolved	ug/L	<0.27	500	500	453	450	91	90	75-125	1	20	
Sodium, Dissolved	ug/L	11900	20000	20000	30500	30400	93	92	75-125	0	20	
Thallium, Dissolved	ug/L	4.9J	1000	1000	936	929	93	92	75-125	1	20	
Vanadium, Dissolved	ug/L	7.9J	1000	1000	895	890	89	88	75-125	1	20	
Zinc, Dissolved	ug/L	45.3	1000	1000	971	960	93	91	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

QC Batch: 515183

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2801392

Matrix: Water

Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	12/22/17 10:47	

LABORATORY CONTROL SAMPLE & LCSD: 2801393

2801394

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	39.6	38.8	99	97	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801395

2801396

Parameter	Units	10414961001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	682	40	40	696	719	34	92	80-120	3	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801397

2801398

Parameter	Units	10414961016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	800	40	40	845	849	113	121	80-120	0	30	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

QC Batch: 514910

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2800064

Matrix: Water

Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/21/17 16:06	

LABORATORY CONTROL SAMPLE: 2800065

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	990	99	80-120	

SAMPLE DUPLICATE: 2800066

Parameter	Units	10414961012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	853	833	2	10	

SAMPLE DUPLICATE: 2800067

Parameter	Units	10414961016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1500	1460	3	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

QC Batch: 97371 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 419093 Matrix: Water

Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/20/17 15:21	

LABORATORY CONTROL SAMPLE: 419094

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.21	107	90-110	

MATRIX SPIKE SAMPLE: 419096

Parameter	Units	2067367001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	ND	.2	0.10	50	75-125	M1

SAMPLE DUPLICATE: 419095

Parameter	Units	2067367001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	ND	<0.0050		20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

QC Batch: 514053 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2795704 Matrix: Water

Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	12/16/17 11:28	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/16/17 11:28	
Sulfate	mg/L	<0.27	1.2	0.27	12/16/17 11:28	

LABORATORY CONTROL SAMPLE: 2795705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.6	101	90-110	
Nitrate as N	mg/L	1	0.99	99	90-110	
Sulfate	mg/L	12.5	12.9	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2795706 2795707

Parameter	Units	10414755001		2795706		2795707		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec						
Chloride	mg/L	1.9	12.5	12.5	14.1	14.2	98	99	90-110	1	20		
Nitrate as N	mg/L	0.073J	1	1	1.0	1.0	97	98	90-110	1	20		
Sulfate	mg/L	14.1	12.5	12.5	24.4	24.4	82	83	90-110	0	20	M1	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

QC Batch: 515347 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10414755001, 10414755002

METHOD BLANK: 2802262 Matrix: Water  
Associated Lab Samples: 10414755001, 10414755002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 13:41	

LABORATORY CONTROL SAMPLE: 2802263

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802264 2802265

Parameter	Units	10414407002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	4.2	5	5	9.3	9.0	101	95	90-110	3	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802266 2802267

Parameter	Units	10414496003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	0.11	1	1	1.1	1.0	97	93	90-110	4	20		

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**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

QC Batch: 515348 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10414755003

METHOD BLANK: 2802268 Matrix: Water  
Associated Lab Samples: 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 14:17	FS

LABORATORY CONTROL SAMPLE: 2802269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802270 2802271

Parameter	Units	10414755003		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Nitrogen, NO2 plus NO3	mg/L	1.7	1	1	1	2.7	2.6	98	91	90-110	3	20 E

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802272 2802273

Parameter	Units	10415446001		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	1	0.88	0.87	87	86	90-110	1	20 M1

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

QC Batch: 514212 Analysis Method: EPA 410.4

QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD

Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 2796404 Matrix: Water

Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	12/18/17 14:11	

LABORATORY CONTROL SAMPLE: 2796405

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	306	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796406 2796407

Parameter	Units	10414657001		2796406		2796407		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	ND	250	250	256	260	102	104	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2796408 2796409

Parameter	Units	10414657002		2796408		2796409		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	ND	250	250	259	272	104	109	90-110	5	20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

QC Batch: 134385 Analysis Method: SM 5310C  
QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
Associated Lab Samples: 10414755001, 10414755002, 10414755003

METHOD BLANK: 535599 Matrix: Water  
Associated Lab Samples: 10414755001, 10414755002, 10414755003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	12/29/17 16:19	

LABORATORY CONTROL SAMPLE: 535600

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	26.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535601 535602

Parameter	Units	10415193001		535602		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	5.7	25	25	31.4	31.3	103	103	80-120	0	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535603 535604

Parameter	Units	10415189001		535604		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	3.8	25	25	29.3	29.2	102	102	80-120	1	20

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414755

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414755

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414755001	MW-14d-GW-121517	RSK 175	514904		
10414755002	MW-18d-GW-121517	RSK 175	514904		
10414755003	MW-4d-GW-121517	RSK 175	514904		
10414755001	MW-14d-GW-121517	EPA 3010	514108	6010C Met	515071
10414755002	MW-18d-GW-121517	EPA 3010	514108	6010C Met	515071
10414755003	MW-4d-GW-121517	EPA 3010	514108	6010C Met	515071
10414755001	MW-14d-GW-121517	EPA 7470A	514122	EPA 7470A	515039
10414755002	MW-18d-GW-121517	EPA 7470A	514122	EPA 7470A	515039
10414755003	MW-4d-GW-121517	EPA 7470A	514122	EPA 7470A	515039
10414755001	MW-14d-GW-121517	SM 2320B	515183		
10414755002	MW-18d-GW-121517	SM 2320B	515183		
10414755003	MW-4d-GW-121517	SM 2320B	515183		
10414755001	MW-14d-GW-121517	SM 2540C	514910		
10414755002	MW-18d-GW-121517	SM 2540C	514910		
10414755003	MW-4d-GW-121517	SM 2540C	514910		
10414755001	MW-14d-GW-121517	SM 4500-S-2 D	97371		
10414755002	MW-18d-GW-121517	SM 4500-S-2 D	97371		
10414755003	MW-4d-GW-121517	SM 4500-S-2 D	97371		
10414755001	MW-14d-GW-121517	EPA 300.0	514053		
10414755002	MW-18d-GW-121517	EPA 300.0	514053		
10414755003	MW-4d-GW-121517	EPA 300.0	514053		
10414755001	MW-14d-GW-121517	EPA 353.2	515347		
10414755002	MW-18d-GW-121517	EPA 353.2	515347		
10414755003	MW-4d-GW-121517	EPA 353.2	515348		
10414755001	MW-14d-GW-121517	EPA 410.4	514212	EPA 410.4	514345
10414755002	MW-18d-GW-121517	EPA 410.4	514212	EPA 410.4	514345
10414755003	MW-4d-GW-121517	EPA 410.4	514212	EPA 410.4	514345
10414755001	MW-14d-GW-121517	SM 5310C	134385		
10414755002	MW-18d-GW-121517	SM 5310C	134385		
10414755003	MW-4d-GW-121517	SM 5310C	134385		

**REPORT OF LABORATORY ANALYSIS**

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**Sample Condition Upon Receipt - ESI Tech Specs** Client Name: CH2M Hill Project #: **WO# : 10414755**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
 Tracking Number: 744810327977

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer Used:  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.0 Cooler Temp Corrected (°C): 3.1 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: BC 12-16-17  
 USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/BO15 (water) and Dioxin. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-3/1</u> , <u>1-3/1</u> , <u>1-3/1</u>
Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>10:16</u> Temp: <u>3.0</u>	Corrected Temp: <u>3.1</u>	
Time: <u>10:20</u> put in cooler		
Time: _____ Temp: _____	Corrected Temp: _____	

JENNI GROSS

Project Manager Review: \_\_\_\_\_ Date: 12/18/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers ill be sent to the North Carolina DEHNR Certification Office (i.e out of





Sample Condition Upon R

WO#: 2067267

PM: CMM

Due Date: 01/03/18

CLIENT: PASI-MINN

1000 Riverbend Blvd., Suite F
St. Rose, LA 70087

Project #

Courier: Pace Courier, Hired Courier, Fed X, UPS, DHL, USPS, Customer, Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact: Yes, No

Thermometer Used: Therm Fisher IR 5, Therm Fisher IR 6, Therm Fisher IR 7

Type of Ice: Wet, Blue, None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12-19-17

Temp must be measured from Temperature blank when present Comments:

Table with 15 rows of inspection criteria and checkboxes. Includes items like 'Temperature Blank Present?', 'Chain of Custody Present', etc.

Client Notification/ Resolution:

Person Contacted: Date/Time:

Comments/ Resolution:

# Chain of Custody

**WO#: 12102758**

PM: HRZ      Due Date: 01/03/18  
 CLIENT: PACE MPLS

Workorder: 10414755      Workorder Name: 1497 Freeman WA-Grain Handling      Owner Received Date: 12/16/2017      Results Requested By: 1/3/2018

Report To		Subcontract To				Requested Analysis												
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042				5632354 / 5310 TOC												
Preserved Containers														LAB USE ONLY				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4												
1	MW-14d-GW-121517	PS	12/15/2017 10:25	10414755001	Water	1									X			
2	MW-18d-GW-121517	PS	12/15/2017 11:35	10414755002	Water	1									X			
3	MW-4d-GW-121517	PS	12/15/2017 13:25	10414755003	Water	1									X			
4																		
5																		
														Comments				
Transfers	Released By	Date/Time	Received By	Date/Time														
1	<i>Long Jedd Pace</i>	<i>12/15/17 17:30</i>	<i>[Signature]</i>	<i>12/16/17 18:35</i>														
2	<i>[Signature]</i>	<i>12/16/17 22:24</i>	<i>B. Mathews</i>	<i>12/20/17 0600</i>														
3																		
Cooler Temperature on Receipt		19 °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N										

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



**WO#: 12102758**  
 PM: HRZ Due Date: 01/03/18  
 CLIENT: PACE MPLS

**Sample Condition Upon Receipt**

Client Name: Pace-MPLS Project #: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: HOE POC Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.6 Cooler Temp Corrected °C: 1.9 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 1.03 Date and Initials of Person Examining Contents: JPIC 12/14/17

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.	
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.	
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.	
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.	If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.	
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.	
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.	
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.	
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.	Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.	
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>			
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.	
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.	
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased): _____			

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 12/20/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHHS Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 20, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414757

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 16, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10414757001	MW-14d-GW-121517	Water	12/15/17 10:25	12/16/17 09:35
10414757002	MW-18d-GW-121517	Water	12/15/17 11:35	12/16/17 09:35
10414757003	MW-4d-GW-121517	Water	12/15/17 13:25	12/16/17 09:35
10414757004	Trip Blank	Water	12/15/17 00:00	12/16/17 09:35

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10414757

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10414757001	MW-14d-GW-121517	EPA 8260B	DJB	83	PASI-M
10414757002	MW-18d-GW-121517	EPA 8260B	DJB	83	PASI-M
10414757003	MW-4d-GW-121517	EPA 8260B	DJB	83	PASI-M
10414757004	Trip Blank	EPA 8260B	DJB	83	PASI-M

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10414757003</b>	<b>MW-4d-GW-121517</b>					
EPA 8260B	Carbon tetrachloride	6.4	ug/L	0.50	12/19/17 05:18	

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 20, 2017

### General Information:

4 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- MW-14d-GW-121517 (Lab ID: 10414757001)
- MW-18d-GW-121517 (Lab ID: 10414757002)
- MW-4d-GW-121517 (Lab ID: 10414757003)
- Trip Blank (Lab ID: 10414757004)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 514230

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

**Sample: MW-14d-GW-121517**      **Lab ID: 10414757001**      Collected: 12/15/17 10:25      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 04:31	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 04:31	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 04:31	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 04:31	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:31	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:31	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 04:31	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:31	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 04:31	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 04:31	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 04:31	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 04:31	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 04:31	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 04:31	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 04:31	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:31	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:31	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 04:31	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 04:31	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 04:31	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 04:31	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 04:31	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 04:31	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 04:31	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 04:31	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 04:31	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 04:31	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 04:31	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:31	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 04:31	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 04:31	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 04:31	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 04:31	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 04:31	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 04:31	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 04:31	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 04:31	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 04:31	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

**Sample: MW-14d-GW-121517**      **Lab ID: 10414757001**      Collected: 12/15/17 10:25      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 04:31	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 04:31	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 04:31	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 04:31	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 04:31	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 04:31	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 04:31	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:31	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 04:31	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 04:31	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 04:31	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 04:31	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 04:31	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 04:31	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 04:31	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:31	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 04:31	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:31	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:31	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 04:31	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:31	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 04:31	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 04:31	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 04:31	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 04:31	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:31	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 04:31	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		12/19/17 04:31	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1		12/19/17 04:31	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/19/17 04:31	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

Sample: **MW-18d-GW-121517** Lab ID: **10414757002** Collected: 12/15/17 11:35 Received: 12/16/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 04:55	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 04:55	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 04:55	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 04:55	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:55	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:55	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 04:55	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:55	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 04:55	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 04:55	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 04:55	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 04:55	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 04:55	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 04:55	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 04:55	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 04:55	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:55	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 04:55	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 04:55	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 04:55	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 04:55	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 04:55	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 04:55	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 04:55	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 04:55	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 04:55	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 04:55	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 04:55	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:55	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 04:55	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 04:55	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 04:55	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 04:55	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 04:55	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 04:55	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 04:55	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 04:55	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 04:55	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

**Sample: MW-18d-GW-121517**      **Lab ID: 10414757002**      Collected: 12/15/17 11:35      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 04:55	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 04:55	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 04:55	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 04:55	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 04:55	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 04:55	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 04:55	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 04:55	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 04:55	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 04:55	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 04:55	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 04:55	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 04:55	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 04:55	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 04:55	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:55	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 04:55	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 04:55	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:55	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 04:55	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 04:55	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 04:55	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 04:55	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 04:55	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 04:55	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 04:55	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 04:55	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		12/19/17 04:55	17060-07-0	
Toluene-d8 (S)	94	%	75-125		1		12/19/17 04:55	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125		1		12/19/17 04:55	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10414757

Sample: **MW-4d-GW-121517** Lab ID: **10414757003** Collected: 12/15/17 13:25 Received: 12/16/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 05:18	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 05:18	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 05:18	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 05:18	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 05:18	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 05:18	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 05:18	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 05:18	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 05:18	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 05:18	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 05:18	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 05:18	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 05:18	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 05:18	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 05:18	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 05:18	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 05:18	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 05:18	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 05:18	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 05:18	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 05:18	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 05:18	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 05:18	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 05:18	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 05:18	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 05:18	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 05:18	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 05:18	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 05:18	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 05:18	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 05:18	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 05:18	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 05:18	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 05:18	75-15-0	
Carbon tetrachloride	6.4	ug/L	0.50	0.20	1		12/19/17 05:18	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 05:18	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 05:18	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 05:18	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

Sample: **MW-4d-GW-121517** Lab ID: **10414757003** Collected: 12/15/17 13:25 Received: 12/16/17 09:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 05:18	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 05:18	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 05:18	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 05:18	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 05:18	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 05:18	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 05:18	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 05:18	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 05:18	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 05:18	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 05:18	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 05:18	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 05:18	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 05:18	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 05:18	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 05:18	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 05:18	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 05:18	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 05:18	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 05:18	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 05:18	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 05:18	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 05:18	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 05:18	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 05:18	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 05:18	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 05:18	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		12/19/17 05:18	17060-07-0	
Toluene-d8 (S)	95	%	75-125		1		12/19/17 05:18	2037-26-5	
4-Bromofluorobenzene (S)	93	%	75-125		1		12/19/17 05:18	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10414757

**Sample: Trip Blank**      **Lab ID: 10414757004**      Collected: 12/15/17 00:00      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 00:36	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/19/17 00:36	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/19/17 00:36	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/19/17 00:36	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/19/17 00:36	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/19/17 00:36	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/19/17 00:36	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 00:36	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		12/19/17 00:36	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/19/17 00:36	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/19/17 00:36	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/19/17 00:36	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/19/17 00:36	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/19/17 00:36	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/19/17 00:36	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/19/17 00:36	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 00:36	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/19/17 00:36	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/19/17 00:36	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/19/17 00:36	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/19/17 00:36	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/19/17 00:36	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/19/17 00:36	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/19/17 00:36	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/19/17 00:36	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/19/17 00:36	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/19/17 00:36	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/19/17 00:36	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/19/17 00:36	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 00:36	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/19/17 00:36	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/19/17 00:36	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/19/17 00:36	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/19/17 00:36	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/19/17 00:36	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/19/17 00:36	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/19/17 00:36	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/19/17 00:36	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

**Sample: Trip Blank**      **Lab ID: 10414757004**      Collected: 12/15/17 00:00      Received: 12/16/17 09:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/19/17 00:36	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/19/17 00:36	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/19/17 00:36	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/19/17 00:36	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/19/17 00:36	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/19/17 00:36	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/19/17 00:36	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/19/17 00:36	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/19/17 00:36	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/19/17 00:36	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/19/17 00:36	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/19/17 00:36	108-05-4	L2
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/19/17 00:36	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/19/17 00:36	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/19/17 00:36	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		12/19/17 00:36	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/19/17 00:36	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		12/19/17 00:36	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 00:36	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/19/17 00:36	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/19/17 00:36	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/19/17 00:36	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/19/17 00:36	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/19/17 00:36	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/19/17 00:36	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		12/19/17 00:36	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/19/17 00:36	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		12/19/17 00:36	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		12/19/17 00:36	2037-26-5	
4-Bromofluorobenzene (S)	94	%	75-125		1		12/19/17 00:36	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

QC Batch: 514230 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10414757001, 10414757002, 10414757003, 10414757004

METHOD BLANK: 2796443 Matrix: Water  
Associated Lab Samples: 10414757001, 10414757002, 10414757003, 10414757004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/19/17 00:13	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/19/17 00:13	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/19/17 00:13	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/19/17 00:13	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	12/19/17 00:13	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/19/17 00:13	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/19/17 00:13	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/19/17 00:13	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/19/17 00:13	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/19/17 00:13	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/19/17 00:13	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/19/17 00:13	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/19/17 00:13	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/19/17 00:13	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/19/17 00:13	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/19/17 00:13	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/19/17 00:13	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/19/17 00:13	
Acetone	ug/L	<8.8	20.0	8.8	12/19/17 00:13	
Acrolein	ug/L	<4.8	10.0	4.8	12/19/17 00:13	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/19/17 00:13	
Benzene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/19/17 00:13	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
Bromoform	ug/L	<1.0	4.0	1.0	12/19/17 00:13	
Bromomethane	ug/L	<1.5	4.0	1.5	12/19/17 00:13	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/19/17 00:13	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/19/17 00:13	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

METHOD BLANK: 2796443

Matrix: Water

Associated Lab Samples: 10414757001, 10414757002, 10414757003, 10414757004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Chloroethane	ug/L	<0.44	1.0	0.44	12/19/17 00:13	
Chloroform	ug/L	<0.46	1.0	0.46	12/19/17 00:13	
Chloromethane	ug/L	<1.1	4.0	1.1	12/19/17 00:13	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/19/17 00:13	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/19/17 00:13	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/19/17 00:13	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/19/17 00:13	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/19/17 00:13	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/19/17 00:13	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/19/17 00:13	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/19/17 00:13	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Naphthalene	ug/L	<0.42	1.0	0.42	12/19/17 00:13	
o-Xylene	ug/L	<0.11	0.50	0.11	12/19/17 00:13	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
Styrene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/19/17 00:13	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/19/17 00:13	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/19/17 00:13	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/19/17 00:13	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/19/17 00:13	
Toluene	ug/L	<0.17	0.50	0.17	12/19/17 00:13	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/19/17 00:13	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	12/19/17 00:13	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/19/17 00:13	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/19/17 00:13	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/19/17 00:13	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/19/17 00:13	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/19/17 00:13	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/19/17 00:13	
1,2-Dichloroethane-d4 (S)	%	96	75-137		12/19/17 00:13	
4-Bromofluorobenzene (S)	%	94	75-125		12/19/17 00:13	
Toluene-d8 (S)	%	95	75-125		12/19/17 00:13	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

LABORATORY CONTROL SAMPLE & LCSD: 2796444		2796445									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	22.1	21.8	111	109	75-136	2	30		
1,1,1-Trichloroethane	ug/L	20	23.5	21.1	117	106	75-129	11	30		
1,1,2,2-Tetrachloroethane	ug/L	20	16.6	17.4	83	87	71-138	5	30		
1,1,2-Trichloroethane	ug/L	20	19.2	18.9	96	95	75-125	1	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.1	18.7	101	94	69-126	7	30		
1,1-Dichloroethane	ug/L	20	18.3	17.9	91	89	75-125	2	30		
1,1-Dichloroethene	ug/L	20	19.9	18.7	99	94	75-125	6	30		
1,1-Dichloropropene	ug/L	20	20.8	18.3	104	92	75-125	13	30		
1,2,3-Trichlorobenzene	ug/L	20	18.3	21.6	91	108	75-125	17	30		
1,2,3-Trichloropropane	ug/L	20	20.6	20.9	103	104	75-125	1	30		
1,2,4-Trichlorobenzene	ug/L	20	18.7	19.8	94	99	75-125	6	30		
1,2,4-Trimethylbenzene	ug/L	20	19.3	19.3	96	97	75-125	0	30		
1,2-Dibromo-3-chloropropane	ug/L	50	49.0	52.8	98	106	71-130	7	30		
1,2-Dibromoethane (EDB)	ug/L	20	19.0	19.4	95	97	75-125	2	30		
1,2-Dichlorobenzene	ug/L	20	20.3	20.9	101	105	75-125	3	30		
1,2-Dichloroethane	ug/L	20	17.7	20.1	88	101	70-125	13	30		
1,2-Dichloroethene (Total)	ug/L	40	39.1	34.7	98	87	75-125	12	30		
1,2-Dichloropropane	ug/L	20	17.0	17.9	85	90	75-125	6	30		
1,3,5-Trimethylbenzene	ug/L	20	19.4	19.9	97	100	75-125	2	30		
1,3-Dichlorobenzene	ug/L	20	20.8	21.2	104	106	75-125	2	30		
1,3-Dichloropropane	ug/L	20	19.3	18.8	97	94	75-125	2	30		
1,4-Dichlorobenzene	ug/L	20	20.9	21.4	105	107	75-125	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	394	403	98	101	64-140	2	30		
2,2,4-Trimethylpentane	ug/L	20	17.5	13.7	88	69	68-125	24	30		
2,2-Dichloropropane	ug/L	20	21.1	18.6	105	93	70-131	12	30		
2-Butanone (MEK)	ug/L	100	100	81.2	100	81	69-125	21	30		
2-Chlorotoluene	ug/L	20	19.7	20.2	98	101	75-125	3	30		
2-Hexanone	ug/L	100	94.2	94.1	94	94	73-129	0	30		
4-Chlorotoluene	ug/L	20	18.3	19.1	92	95	75-125	4	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.9	95.3	99	95	73-125	4	30		
Acetone	ug/L	100	106	104	106	104	66-126	2	30		
Acrolein	ug/L	200	168	183	84	92	56-150	9	30		
Acrylonitrile	ug/L	200	135	178	68	89	68-129	27	30		
Benzene	ug/L	20	19.0	18.0	95	90	75-125	5	30		
Bromobenzene	ug/L	20	20.7	21.7	103	108	75-125	5	30		
Bromochloromethane	ug/L	20	20.5	20.5	103	102	75-126	0	30		
Bromodichloromethane	ug/L	20	20.1	19.1	101	96	75-133	5	30		
Bromoform	ug/L	20	20.6	20.7	103	103	62-142	1	30		
Bromomethane	ug/L	20	22.1	24.1	111	120	34-143	8	30		
Carbon disulfide	ug/L	20	19.3	17.5	96	88	71-125	9	30		
Carbon tetrachloride	ug/L	20	23.8	22.1	119	111	71-145	7	30		
Chlorobenzene	ug/L	20	21.1	20.7	106	104	75-125	2	30		
Chloroethane	ug/L	20	20.1	19.5	100	97	75-125	3	30		
Chloroform	ug/L	20	20.6	18.8	103	94	75-125	9	30		
Chloromethane	ug/L	20	19.0	17.8	95	89	54-125	6	30		
cis-1,2-Dichloroethene	ug/L	20	19.4	16.9	97	84	75-125	14	30		
cis-1,3-Dichloropropene	ug/L	20	19.6	19.0	98	95	75-125	3	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

LABORATORY CONTROL SAMPLE & LCSD: 2796444		2796445								
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Dibromochloromethane	ug/L	20	22.0	22.0	110	110	74-141	0	30	
Dibromomethane	ug/L	20	22.2	21.2	111	106	75-125	5	30	
Dichlorodifluoromethane	ug/L	20	21.0	20.1	105	100	59-130	5	30	
Dichlorofluoromethane	ug/L	20	20.7	19.4	104	97	75-125	6	30	
Diisopropyl ether	ug/L	20	17.1	17.2	86	86	69-125	0	30	
Ethyl-tert-butyl ether	ug/L	20	15.1	17.9	76	90	73-125	17	30	
Ethylbenzene	ug/L	20	20.9	20.7	105	103	75-125	1	30	
Hexachloro-1,3-butadiene	ug/L	20	20.2	21.4	101	107	75-131	6	30	
Isopropylbenzene (Cumene)	ug/L	20	20.3	19.8	102	99	75-125	3	30	
m&p-Xylene	ug/L	40	43.5	42.8	109	107	75-125	2	30	
Methyl-tert-butyl ether	ug/L	20	19.6	19.3	98	97	75-125	1	30	
Methylene Chloride	ug/L	20	15.1	16.5	75	83	73-125	9	30	
n-Butylbenzene	ug/L	20	18.5	18.7	93	93	75-125	1	30	
n-Propylbenzene	ug/L	20	18.5	18.7	92	94	75-125	1	30	
Naphthalene	ug/L	20	16.8	19.5	84	97	74-125	14	30	
o-Xylene	ug/L	20	20.1	20.4	101	102	75-125	1	30	
p-Isopropyltoluene	ug/L	20	19.7	19.2	98	96	75-125	2	30	
sec-Butylbenzene	ug/L	20	19.2	19.7	96	99	75-125	3	30	
Styrene	ug/L	20	20.0	20.0	100	100	75-125	0	30	
tert-Amylmethyl ether	ug/L	20	19.3	18.9	97	94	71-126	2	30	
tert-Butyl Alcohol	ug/L	200	227	214	113	107	69-131	6	30	
tert-Butylbenzene	ug/L	20	19.2	20.1	96	101	75-125	4	30	
Tetrachloroethene	ug/L	20	20.7	20.3	103	101	75-125	2	30	
Tetrahydrofuran	ug/L	200	249	204	125	102	65-127	20	30	
Toluene	ug/L	20	18.0	19.9	90	100	75-125	10	30	
trans-1,2-Dichloroethene	ug/L	20	19.6	17.8	98	89	75-125	10	30	
trans-1,3-Dichloropropene	ug/L	20	19.9	19.6	100	98	75-125	2	30	
trans-1,4-Dichloro-2-butene	ug/L	50	45.3	46.2	91	92	30-150	2	30	
Trichloroethene	ug/L	20	22.2	21.4	111	107	75-125	4	30	
Trichlorofluoromethane	ug/L	20	22.8	21.1	114	105	71-140	8	30	
Vinyl acetate	ug/L	20	12.7	16.0	64	80	68-137	22	30 L2	
Vinyl chloride	ug/L	20	18.7	17.5	93	88	70-125	6	30	
Xylene (Total)	ug/L	60	63.6	63.2	106	105	75-125	1	30	
1,2-Dichloroethane-d4 (S)	%				99	96	75-137			
4-Bromofluorobenzene (S)	%				90	94	75-125			
Toluene-d8 (S)	%				86	97	75-125			

MATRIX SPIKE SAMPLE: 2796446		10414592001						
Parameter	Units	Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	21.6	108	75-137		
1,1,1-Trichloroethane	ug/L	<0.15	20	22.5	113	75-139		
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	16.8	84	60-142		
1,1,2-Trichloroethane	ug/L	<0.22	20	18.8	94	75-128		
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	21.0	105	62-150		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

MATRIX SPIKE SAMPLE: 2796446		10414592001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
1,1-Dichloroethane	ug/L	<0.14	20	16.5	82	70-129	
1,1-Dichloroethene	ug/L	<0.18	20	20.4	102	67-141	
1,1-Dichloropropene	ug/L	<0.18	20	20.0	100	64-144	
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20.6	103	66-139	
1,2,3-Trichloropropane	ug/L	<0.66	20	20.4	102	69-134	
1,2,4-Trichlorobenzene	ug/L	<0.18	20	19.6	98	65-138	
1,2,4-Trimethylbenzene	ug/L	<0.098	20	18.5	92	65-143	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	48.6	97	61-134	
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	18.9	95	74-129	
1,2-Dichlorobenzene	ug/L	<0.21	20	19.9	100	68-135	
1,2-Dichloroethane	ug/L	<0.15	20	20.7	104	73-125	
1,2-Dichloroethene (Total)	ug/L	<0.41	40	38.2	95	69-134	
1,2-Dichloropropane	ug/L	<0.62	20	20.4	102	64-130	
1,3,5-Trimethylbenzene	ug/L	<0.18	20	19.0	95	64-146	
1,3-Dichlorobenzene	ug/L	<0.16	20	20.2	101	69-135	
1,3-Dichloropropane	ug/L	<0.13	20	19.0	95	67-128	
1,4-Dichlorobenzene	ug/L	<0.10	20	20.1	100	66-134	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	366	92	58-140	
2,2,4-Trimethylpentane	ug/L	<1.3	20	19.3	97	48-150	
2,2-Dichloropropane	ug/L	<0.40	20	20.3	102	50-150	
2-Butanone (MEK)	ug/L	<2.4	100	94.1	94	58-125	
2-Chlorotoluene	ug/L	<0.20	20	19.5	97	65-138	
2-Hexanone	ug/L	<2.5	100	94.1	94	61-134	
4-Chlorotoluene	ug/L	<0.13	20	18.1	90	68-135	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	96.7	97	61-130	
Acetone	ug/L	<8.8	100	165	165	51-140	M1
Acrolein	ug/L	<4.8	200	189	95	48-150	
Acrylonitrile	ug/L	<4.9	200	150	75	55-134	
Benzene	ug/L	<0.13	20	20.2	101	63-132	
Bromobenzene	ug/L	<0.16	20	20.4	102	67-138	
Bromochloromethane	ug/L	<0.38	20	20.5	102	66-138	
Bromodichloromethane	ug/L	<0.20	20	21.0	105	75-137	
Bromoform	ug/L	<1.0	20	20.2	101	65-129	
Bromomethane	ug/L	<1.5	20	25.5	127	41-150	
Carbon disulfide	ug/L	<0.37	20	19.0	95	72-132	
Carbon tetrachloride	ug/L	<0.20	20	23.4	117	75-150	
Chlorobenzene	ug/L	<0.14	20	20.5	103	73-127	
Chloroethane	ug/L	<0.44	20	20.6	103	74-138	
Chloroform	ug/L	<0.46	20	19.9	100	74-125	
Chloromethane	ug/L	<1.1	20	19.0	95	58-129	
cis-1,2-Dichloroethene	ug/L	<0.20	20	17.5	87	63-135	
cis-1,3-Dichloropropene	ug/L	<0.12	20	19.3	97	66-129	
Dibromochloromethane	ug/L	<0.13	20	21.5	108	75-133	
Dibromomethane	ug/L	<0.50	20	23.2	116	68-134	
Dichlorodifluoromethane	ug/L	<0.31	20	23.5	117	72-150	
Dichlorofluoromethane	ug/L	<0.38	20	20.9	104	75-129	
Diisopropyl ether	ug/L	<0.12	20	14.5	73	62-128	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

MATRIX SPIKE SAMPLE: 2796446		10414592001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Ethyl-tert-butyl ether	ug/L	<0.13	20	16.5	83	63-132	
Ethylbenzene	ug/L	<0.14	20	20.4	102	72-130	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	19.9	99	71-150	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	19.9	100	70-136	
m&p-Xylene	ug/L	<0.24	40	42.6	107	64-142	
Methyl-tert-butyl ether	ug/L	<0.14	20	17.1	86	72-125	
Methylene Chloride	ug/L	<1.2	20	15.8	79	60-132	
n-Butylbenzene	ug/L	<0.13	20	17.8	89	60-150	
n-Propylbenzene	ug/L	<0.12	20	18.2	91	63-142	
Naphthalene	ug/L	<0.42	20	18.6	93	67-125	
o-Xylene	ug/L	<0.11	20	19.9	100	60-143	
p-Isopropyltoluene	ug/L	<0.14	20	19.0	95	64-146	
sec-Butylbenzene	ug/L	<0.12	20	18.6	93	67-144	
Styrene	ug/L	<0.14	20	19.4	97	67-136	
tert-Amylmethyl ether	ug/L	<0.12	20	19.5	98	60-134	
tert-Butyl Alcohol	ug/L	<2.2	200	181	90	56-146	
tert-Butylbenzene	ug/L	<0.15	20	19.1	95	68-135	
Tetrachloroethene	ug/L	<0.16	20	20.2	101	67-148	
Tetrahydrofuran	ug/L	<4.3	200	358	179	51-141 M1	
Toluene	ug/L	<0.17	20	19.7	99	61-140	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20.7	104	62-138	
trans-1,3-Dichloropropene	ug/L	<0.14	20	18.6	93	67-134	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	43.9	88	30-150	
Trichloroethene	ug/L	<0.18	20	21.5	108	64-149	
Trichlorofluoromethane	ug/L	<0.13	20	24.4	122	75-150	
Vinyl acetate	ug/L	<1.5	20	14.6	73	49-143	
Vinyl chloride	ug/L	<0.096	20	19.5	97	75-133	
Xylene (Total)	ug/L	<0.24	60	62.5	104	63-142	
1,2-Dichloroethane-d4 (S)	%				95	75-137	
4-Bromofluorobenzene (S)	%				92	75-125	
Toluene-d8 (S)	%				93	75-125	

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002	Dup	RPD	Max	Qualifiers
		Result	Result		RPD	
1,1,1,2-Tetrachloroethane	ug/L	<0.14	<0.14		30	
1,1,1-Trichloroethane	ug/L	<0.15	<0.15		30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	<0.19		30	
1,1,2-Trichloroethane	ug/L	<0.22	<0.22		30	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	<0.28		30	
1,1-Dichloroethane	ug/L	<0.14	<0.14		30	
1,1-Dichloroethene	ug/L	<0.18	<0.18		30	
1,1-Dichloropropene	ug/L	<0.18	<0.18		30	
1,2,3-Trichlorobenzene	ug/L	<0.14	<0.14		30	
1,2,3-Trichloropropane	ug/L	<0.66	<0.66		30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	<0.18	<0.18		30	
1,2,4-Trimethylbenzene	ug/L	<0.098	<0.098		30	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0		30	
1,2-Dibromoethane (EDB)	ug/L	<0.17	<0.17		30	
1,2-Dichlorobenzene	ug/L	<0.21	<0.21		30	
1,2-Dichloroethane	ug/L	<0.15	<0.15		30	
1,2-Dichloroethene (Total)	ug/L	<0.41	<0.41		30	
1,2-Dichloropropane	ug/L	<0.62	<0.62		30	
1,3,5-Trimethylbenzene	ug/L	<0.18	<0.18		30	
1,3-Dichlorobenzene	ug/L	<0.16	<0.16		30	
1,3-Dichloropropane	ug/L	<0.13	<0.13		30	
1,4-Dichlorobenzene	ug/L	<0.10	<0.10		30	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	<22.6		30	
2,2,4-Trimethylpentane	ug/L	<1.3	<1.3		30	
2,2-Dichloropropane	ug/L	<0.40	<0.40		30	
2-Butanone (MEK)	ug/L	<2.4	<2.4		30	
2-Chlorotoluene	ug/L	<0.20	<0.20		30	
2-Hexanone	ug/L	<2.5	<2.5		30	
4-Chlorotoluene	ug/L	<0.13	<0.13		30	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	<0.55		30	
Acetone	ug/L	<8.8	<8.8		30	
Acrolein	ug/L	<4.8	<4.8		30	
Acrylonitrile	ug/L	<4.9	<4.9		30	
Benzene	ug/L	<0.13	<0.13		30	
Bromobenzene	ug/L	<0.16	<0.16		30	
Bromochloromethane	ug/L	<0.38	<0.38		30	
Bromodichloromethane	ug/L	<0.20	<0.20		30	
Bromoform	ug/L	<1.0	<1.0		30	
Bromomethane	ug/L	<1.5	<1.5		30	
Carbon disulfide	ug/L	<0.37	<0.37		30	
Carbon tetrachloride	ug/L	<0.20	<0.20		30	
Chlorobenzene	ug/L	<0.14	<0.14		30	
Chloroethane	ug/L	<0.44	<0.44		30	
Chloroform	ug/L	<0.46	<0.46		30	
Chloromethane	ug/L	<1.1	<1.1		30	
cis-1,2-Dichloroethene	ug/L	<0.20	<0.20		30	
cis-1,3-Dichloropropene	ug/L	<0.12	<0.12		30	
Dibromochloromethane	ug/L	<0.13	<0.13		30	
Dibromomethane	ug/L	<0.50	<0.50		30	
Dichlorodifluoromethane	ug/L	<0.31	<0.31		30	
Dichlorofluoromethane	ug/L	<0.38	<0.38		30	
Diisopropyl ether	ug/L	<0.12	<0.12		30	
Ethyl-tert-butyl ether	ug/L	<0.13	<0.13		30	
Ethylbenzene	ug/L	<0.14	<0.14		30	
Hexachloro-1,3-butadiene	ug/L	<0.48	<0.48		30	
Isopropylbenzene (Cumene)	ug/L	<0.14	<0.14		30	
m&p-Xylene	ug/L	<0.24	<0.24		30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

SAMPLE DUPLICATE: 2796447

Parameter	Units	10414592002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methyl-tert-butyl ether	ug/L	<0.14	<0.14		30	
Methylene Chloride	ug/L	<1.2	<1.2		30	
n-Butylbenzene	ug/L	<0.13	<0.13		30	
n-Propylbenzene	ug/L	<0.12	<0.12		30	
Naphthalene	ug/L	<0.42	<0.42		30	
o-Xylene	ug/L	<0.11	<0.11		30	
p-Isopropyltoluene	ug/L	<0.14	<0.14		30	
sec-Butylbenzene	ug/L	<0.12	<0.12		30	
Styrene	ug/L	<0.14	<0.14		30	
tert-Amylmethyl ether	ug/L	<0.12	<0.12		30	
tert-Butyl Alcohol	ug/L	<2.2	<2.2		30	
tert-Butylbenzene	ug/L	<0.15	<0.15		30	
Tetrachloroethene	ug/L	<0.16	<0.16		30	
Tetrahydrofuran	ug/L	<4.3	<4.3		30	
Toluene	ug/L	<0.17	<0.17		30	
trans-1,2-Dichloroethene	ug/L	<0.21	<0.21		30	
trans-1,3-Dichloropropene	ug/L	<0.14	<0.14		30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	<2.8		30	
Trichloroethene	ug/L	<0.18	<0.18		30	
Trichlorofluoromethane	ug/L	<0.13	<0.13		30	
Vinyl acetate	ug/L	<1.5	<1.5		30	
Vinyl chloride	ug/L	<0.096	<0.096		30	
Xylene (Total)	ug/L	<0.24	<0.24		30	
1,2-Dichloroethane-d4 (S)	%	99	100	1		
4-Bromofluorobenzene (S)	%	93	94	0		
Toluene-d8 (S)	%	97	96	0		

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 514230

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10414757

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10414757001	MW-14d-GW-121517	EPA 8260B	514230		
10414757002	MW-18d-GW-121517	EPA 8260B	514230		
10414757003	MW-4d-GW-121517	EPA 8260B	514230		
10414757004	Trip Blank	EPA 8260B	514230		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10414757

Section A Required Client Information:		Section B Required Project Information:			Section C Invoice Information:					
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz			Attention: Anne Walsh					
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann			Company: UPRR					
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com			Address: 1400 W. 52nd Ave, Denver, CO 80221			Regulatory Agency:		
Phone:   Fax:		Purchase Order # PEDD# 1497-39-Rev1			Pace Quote: Contract# 758938			State / Location:		
Requested Due Date: <b>10 Day Standard</b>		Project Name: Freeman WA-Grain Handling Facility			Pace Project Manager: Jennifer Gross			WA / Freeman		
		Project #: 1497			Pace Profile #: 36447					

ITEM #	SAMPLE ID <small>One Character per box, (A-Z, 0-9 / , -) Sample Ids must be unique</small>	MATRIX <small>Drinking Water DW Water WT Waste Water WW Product P Sol/Solid SL Oil OL Wipe WP Air AR Other OT Tissue TS</small>	CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Y/N	Requested Analysis Filtered (Y/N)																					
						START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Analysis Test	Y																				
						DATE	TIME	DATE	TIME											Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 8310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 350.2											
1	MW-14d-GW-121517	WTG		2017	2017	12/15	1025	-	-	-	3							X																					001	
2	MW-18d-GW-121517	WTG		2017	2017	12/15	1135	-	-	-	3							X																					002	
3	MW-4d-GW-121517	WTG		2017	2017	12/15	1325	-	-	-	3							X																					003	
4	Trip Blank	WTG		2017	2017	12/15	-	-	-	-	2							X																					004	
5																																								
6																																								
7																																								
8																																								
9																																								
10																																								
11																																								
12																																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	<i>Jonathan C.</i>	12/15/17	1930	<i>UPRR PACE</i>	12-16-17	9:35	3.1	Y	Y	Y
*Field filtered by client										


SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <i>Jonathan Espinoza</i>	DATE Signed: <i>12/15/17</i>					
SIGNATURE of SAMPLER: <i>Jonathan C.</i>						

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: **CH2M Hill**

Project #:

**WO# : 10414757**



10414757

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: **744810327977**

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  151401163  687A9155100842 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): **3.0** Cooler Temp Corrected (°C): **3.1** Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C Correction Factor: **+0.1** Date and Initials of Person Examining Contents: **BC 12-16-17**

USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. <b>NO MS/MSD</b>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	
Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>141537</b>	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Field Data Required?  Yes  No

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <b>10:10</b> Temp: <b>3.0</b>	Corrected Temp: <b>3.1</b>
Time: <b>10:20</b> put in cooler	
Time: _____ Temp: _____	Corrected Temp: _____

**Project Manager Review:**

Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers)

**JENNI GROSS**

Date: **12/18/17**

Form will be sent to the North Carolina DEHNR Certification Office (i.e. out of

January 03, 2018

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

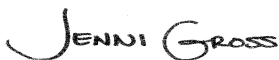
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415136

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 20, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
 A2LA Certification #: 2926.01  
 Alabama Certification #: 40770  
 Alaska Contaminated Sites Certification #: 17-009  
 Alaska DW Certification #: MN00064  
 Arizona Certification #: AZ0014  
 Arkansas Certification #: 88-0680  
 California Certification #: 2929  
 CNMI Saipan Certification #: MP0003  
 Colorado Certification #: MN00064  
 Connecticut Certification #: PH-0256  
 EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
 Florida Certification #: E87605  
 Georgia Certification #: 959  
 Guam EPA Certification #: MN00064  
 Hawaii Certification #: MN00064  
 Idaho Certification #: MN00064  
 Illinois Certification #: 200011  
 Indiana Certification #: C-MN-01  
 Iowa Certification #: 368  
 Kansas Certification #: E-10167  
 Kentucky DW Certification #: 90062  
 Kentucky WW Certification #: 90062  
 Louisiana DEQ Certification #: 03086  
 Louisiana DW Certification #: MN00064  
 Maine Certification #: MN00064  
 Maryland Certification #: 322  
 Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
 Minnesota Certification #: 027-053-137  
 Mississippi Certification #: MN00064  
 Montana Certification #: CERT0092  
 Nebraska Certification #: NE-OS-18-06  
 Nevada Certification #: MN00064  
 New Hampshire Certification #: 2081  
 New Jersey Certification #: MN002  
 New York Certification #: 11647  
 North Carolina DW Certification #: 27700  
 North Carolina WW Certification #: 530  
 North Dakota Certification #: R-036  
 Ohio DW Certification #: 41244  
 Ohio VAP Certification #: CL101  
 Oklahoma Certification #: 9507  
 Oregon NwTPH Certification #: MN300001  
 Oregon Secondary Certification #: MN200001  
 Pennsylvania Certification #: 68-00563  
 Puerto Rico Certification #: MN00064  
 South Carolina Certification #: 74003001  
 Tennessee Certification #: TN02818  
 Texas Certification #: T104704192  
 Utah Certification #: MN00064  
 Virginia Certification #: 460163  
 Washington Certification #: C486  
 West Virginia DW Certification #: 9952 C  
 West Virginia DEP Certification #: 382  
 Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
 Montana Certificate #CERT0103  
 California Certification #2973  
 California Certification #2973  
 Alaska Certification UST-107  
 Alaska Certification UST-107  
 Alaska Certification #MN01084  
 Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
 North Dakota Certification: # R-203  
 Wisconsin DNR Certification #: 998027470  
 WA Department of Ecology Lab ID# C1007  
 Nevada DNR #MN010842018-1  
 Oklahoma Department of Environmental Quality  
 California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
 Florida Department of Health (NELAC): E87595  
 Illinois Environmental Protection Agency: 0025721  
 Kansas Department of Health and Environment (NELAC): E-10266  
 Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
 Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
 U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
 Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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<b>Lab ID</b>	<b>Sample ID</b>	<b>Matrix</b>	<b>Date Collected</b>	<b>Date Received</b>
<b>10415136001</b>	<b>MW5d-GW-121917</b>	Water	12/19/17 13:05	12/20/17 11:20

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415136001	MW5d-GW-121917	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415136001</b>	<b>MW5d-GW-121917</b>					
RSK 175	Methane	4.7J	ug/L	10.0	12/26/17 11:55	
6010C Met	Aluminum, Dissolved	167J	ug/L	200	12/29/17 23:02	
6010C Met	Barium, Dissolved	87.1	ug/L	10.0	12/29/17 23:02	
6010C Met	Calcium, Dissolved	44800	ug/L	500	12/29/17 23:02	
6010C Met	Copper, Dissolved	0.98J	ug/L	10.0	12/29/17 23:02	
6010C Met	Iron, Dissolved	155	ug/L	50.0	12/29/17 23:02	
6010C Met	Lead, Dissolved	3.7J	ug/L	10.0	12/29/17 23:02	
6010C Met	Magnesium, Dissolved	13300	ug/L	500	12/29/17 23:02	
6010C Met	Manganese, Dissolved	16.1	ug/L	5.0	12/29/17 23:02	
6010C Met	Potassium, Dissolved	2210J	ug/L	2500	12/29/17 23:02	
6010C Met	Sodium, Dissolved	18400	ug/L	1000	12/29/17 23:02	
6010C Met	Thallium, Dissolved	7.4J	ug/L	20.0	12/29/17 23:02	
6010C Met	Vanadium, Dissolved	5.3J	ug/L	15.0	12/29/17 23:02	
6010C Met	Zinc, Dissolved	3.3J	ug/L	20.0	12/29/17 23:02	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	213	mg/L	5.0	12/28/17 13:03	
SM 2540C	Total Dissolved Solids	251	mg/L	10.0	12/22/17 14:50	
EPA 300.0	Chloride	1.3	mg/L	1.2	12/20/17 18:30	
EPA 300.0	Nitrate as N	0.28	mg/L	0.10	12/20/17 18:30	
EPA 300.0	Sulfate	2.7	mg/L	1.2	12/20/17 18:30	B
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	0.34	mg/L	0.020	12/23/17 13:52	
SM 5310C	Total Organic Carbon	0.83J	mg/L	1.0	01/02/18 15:51	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515839

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415155008,10415459002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2804171)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2804172)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

### General Information:

1 sample was analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 97726

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415136001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 420841)
- Sulfide, Total

### Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

### General Information:

1 sample was analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 514828

B: Analyte was detected in the associated method blank.

- BLANK for HBN 514828 [WETA/338 (Lab ID: 2799528)]
  - Sulfate

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 514828

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414988001,10415136001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2799532)
  - Sulfate
- MSD (Lab ID: 2799533)
  - Sulfate

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515348

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414755003,10415446001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2802272)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802273)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

Analyte Comments:

QC Batch: 515348

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2802270)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802271)
  - Nitrogen, NO2 plus NO3

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 03, 2018

**General Information:**

1 sample was analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 134386

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 535609)
  - Total Organic Carbon
- MSD (Lab ID: 535610)
  - Total Organic Carbon

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

**Sample:** MW5d-GW-121917      **Lab ID:** 10415136001      Collected: 12/19/17 13:05      Received: 12/20/17 11:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/26/17 11:55	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/26/17 11:55	74-85-1	
Methane	4.7J	ug/L	10.0	1.1	1		12/26/17 11:55	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	167J	ug/L	200	8.6	1	12/28/17 10:38	12/29/17 23:02	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	12/28/17 10:38	12/29/17 23:02	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	12/28/17 10:38	12/29/17 23:02	7440-38-2	
Barium, Dissolved	87.1	ug/L	10.0	0.22	1	12/28/17 10:38	12/29/17 23:02	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	12/28/17 10:38	12/29/17 23:02	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	12/28/17 10:38	12/29/17 23:02	7440-43-9	
Calcium, Dissolved	44800	ug/L	500	24.7	1	12/28/17 10:38	12/29/17 23:02	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	12/28/17 10:38	12/29/17 23:02	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	12/28/17 10:38	12/29/17 23:02	7440-48-4	
Copper, Dissolved	0.98J	ug/L	10.0	0.83	1	12/28/17 10:38	12/29/17 23:02	7440-50-8	
Iron, Dissolved	155	ug/L	50.0	16.7	1	12/28/17 10:38	12/29/17 23:02	7439-89-6	
Lead, Dissolved	3.7J	ug/L	10.0	3.0	1	12/28/17 10:38	12/29/17 23:02	7439-92-1	
Magnesium, Dissolved	13300	ug/L	500	2.6	1	12/28/17 10:38	12/29/17 23:02	7439-95-4	
Manganese, Dissolved	16.1	ug/L	5.0	0.38	1	12/28/17 10:38	12/29/17 23:02	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	12/28/17 10:38	12/29/17 23:02	7440-02-0	
Potassium, Dissolved	2210J	ug/L	2500	126	1	12/28/17 10:38	12/29/17 23:02	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	12/28/17 10:38	12/29/17 23:02	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	12/28/17 10:38	12/29/17 23:02	7440-22-4	
Sodium, Dissolved	18400	ug/L	1000	44.6	1	12/28/17 10:38	12/29/17 23:02	7440-23-5	
Thallium, Dissolved	7.4J	ug/L	20.0	4.8	1	12/28/17 10:38	12/29/17 23:02	7440-28-0	
Vanadium, Dissolved	5.3J	ug/L	15.0	0.42	1	12/28/17 10:38	12/29/17 23:02	7440-62-2	
Zinc, Dissolved	3.3J	ug/L	20.0	1.8	1	12/28/17 10:38	12/29/17 23:02	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	12/22/17 13:40	12/26/17 17:18	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	213	mg/L	5.0	1.4	1		12/28/17 13:03		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	251	mg/L	10.0	5.0	1		12/22/17 14:50		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/26/17 13:44	18496-25-8	M1
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.3	mg/L	1.2	0.14	1		12/20/17 18:30	16887-00-6	
Nitrate as N	0.28	mg/L	0.10	0.0079	1		12/20/17 18:30	14797-55-8	
Sulfate	2.7	mg/L	1.2	0.27	1		12/20/17 18:30	14808-79-8	B

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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**Sample: MW5d-GW-121917**      **Lab ID: 10415136001**      Collected: 12/19/17 13:05      Received: 12/20/17 11:20      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.34</b>	mg/L	0.020	0.0075	1		12/23/17 13:52		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:19		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.83J</b>	mg/L	1.0	0.20	1		01/02/18 15:51	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 515357

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10415136001

METHOD BLANK: 2802388

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/26/17 10:21	
Ethene	ug/L	<0.68	10.0	0.68	12/26/17 10:21	
Methane	ug/L	3.8J	10.0	1.1	12/26/17 10:21	

LABORATORY CONTROL SAMPLE & LCSD: 2802389

2802390

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	109	111	96	98	85-115	2	20	
Ethene	ug/L	106	103	104	97	98	85-115	2	20	
Methane	ug/L	60.7	60.2	62.0	99	102	85-115	3	20	

SAMPLE DUPLICATE: 2802392

Parameter	Units	2067578005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	2.4J		20	
Methane	ug/L	69.4	73.3	6	20	

SAMPLE DUPLICATE: 2802527

Parameter	Units	7579315001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	0.0075J mg/L	9.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 515151

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10415136001

METHOD BLANK: 2801264

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	12/26/17 16:41	

LABORATORY CONTROL SAMPLE: 2801265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801266 2801267

Parameter	Units	10414204002		2801266		2801267		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Mercury, Dissolved	ug/L	ND	5	5	5	4.8	4.9	96	97	80-120	1	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 515578

Analysis Method: 6010C Met

QC Batch Method: EPA 3010

Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10415136001

METHOD BLANK: 2803354

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	12/29/17 22:54	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	12/29/17 22:54	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	12/29/17 22:54	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	12/29/17 22:54	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	12/29/17 22:54	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	12/29/17 22:54	
Calcium, Dissolved	ug/L	<24.7	500	24.7	12/29/17 22:54	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	12/29/17 22:54	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	12/29/17 22:54	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	12/29/17 22:54	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	12/29/17 22:54	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	12/29/17 22:54	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	12/29/17 22:54	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	12/29/17 22:54	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	12/29/17 22:54	
Potassium, Dissolved	ug/L	<126	2500	126	12/29/17 22:54	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	12/29/17 22:54	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	12/29/17 22:54	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	12/29/17 22:54	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	12/29/17 22:54	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	12/29/17 22:54	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	12/29/17 22:54	

LABORATORY CONTROL SAMPLE: 2803355

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19200	96	80-120	
Antimony, Dissolved	ug/L	1000	939	94	80-120	
Arsenic, Dissolved	ug/L	1000	928	93	80-120	
Barium, Dissolved	ug/L	1000	946	95	80-120	
Beryllium, Dissolved	ug/L	1000	941	94	80-120	
Cadmium, Dissolved	ug/L	1000	931	93	80-120	
Calcium, Dissolved	ug/L	20000	18100	91	80-120	
Chromium, Dissolved	ug/L	1000	926	93	80-120	
Cobalt, Dissolved	ug/L	1000	931	93	80-120	
Copper, Dissolved	ug/L	1000	904	90	80-120	
Iron, Dissolved	ug/L	20000	18500	93	80-120	
Lead, Dissolved	ug/L	1000	943	94	80-120	
Magnesium, Dissolved	ug/L	20000	18500	93	80-120	
Manganese, Dissolved	ug/L	1000	939	94	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

LABORATORY CONTROL SAMPLE: 2803355

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	931	93	80-120	
Potassium, Dissolved	ug/L	20000	18700	93	80-120	
Selenium, Dissolved	ug/L	1000	991	99	80-120	
Silver, Dissolved	ug/L	500	455	91	80-120	
Sodium, Dissolved	ug/L	20000	18400	92	80-120	
Thallium, Dissolved	ug/L	1000	906	91	80-120	
Vanadium, Dissolved	ug/L	1000	904	90	80-120	
Zinc, Dissolved	ug/L	1000	955	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2803356 2803357

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10415136001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	167J	20000	20000	20200	20400	100	101	75-125	1	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	964	971	96	97	75-125	1	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	947	959	95	96	75-125	1	20	
Barium, Dissolved	ug/L	87.1	1000	1000	1040	1050	95	96	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	961	968	96	97	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	945	954	94	95	75-125	1	20	
Calcium, Dissolved	ug/L	44800	20000	20000	63700	63800	94	95	75-125	0	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	936	944	94	94	75-125	1	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	929	937	93	94	75-125	1	20	
Copper, Dissolved	ug/L	0.98J	1000	1000	928	937	93	94	75-125	1	20	
Iron, Dissolved	ug/L	155	20000	20000	18900	19100	94	95	75-125	1	20	
Lead, Dissolved	ug/L	3.7J	1000	1000	943	956	94	95	75-125	1	20	
Magnesium, Dissolved	ug/L	13300	20000	20000	32600	32800	96	97	75-125	0	20	
Manganese, Dissolved	ug/L	16.1	1000	1000	959	969	94	95	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	923	932	92	93	75-125	1	20	
Potassium, Dissolved	ug/L	2210J	20000	20000	21900	22100	98	100	75-125	1	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	997	1000	100	100	75-125	1	20	
Silver, Dissolved	ug/L	<0.27	500	500	462	466	92	93	75-125	1	20	
Sodium, Dissolved	ug/L	18400	20000	20000	37200	37500	94	95	75-125	1	20	
Thallium, Dissolved	ug/L	7.4J	1000	1000	911	921	90	91	75-125	1	20	
Vanadium, Dissolved	ug/L	5.3J	1000	1000	922	932	92	93	75-125	1	20	
Zinc, Dissolved	ug/L	3.3J	1000	1000	946	954	94	95	75-125	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415136

QC Batch: 515839 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10415136001

METHOD BLANK: 2804168 Matrix: Water  
Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	12/28/17 11:40	

LABORATORY CONTROL SAMPLE & LCSD: 2804169 2804170

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	40.8	41.1	102	103	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2804171 2804172

Parameter	Units	10415155008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	40	40	3.0J	3.6J	7	9	80-120		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2804173 2804174

Parameter	Units	10415459002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	169	40	40	210	215	103	114	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 515162

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10415136001

METHOD BLANK: 2801317

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/22/17 14:50	

LABORATORY CONTROL SAMPLE: 2801318

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	984	98	80-120	

SAMPLE DUPLICATE: 2801319

Parameter	Units	10415278003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	343	352	3	10	

SAMPLE DUPLICATE: 2801320

Parameter	Units	10414980001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1490	1500	1	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 97726

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10415136001

METHOD BLANK: 420838

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/26/17 13:43	

LABORATORY CONTROL SAMPLE: 420839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.20	101	90-110	

MATRIX SPIKE SAMPLE: 420841

Parameter	Units	10415136001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.042	21	75-125	M1

SAMPLE DUPLICATE: 420840

Parameter	Units	10415136001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 514828

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 10415136001

METHOD BLANK: 2799528

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	12/20/17 17:52	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/20/17 17:52	
Sulfate	mg/L	0.41J	1.2	0.27	12/20/17 17:52	

LABORATORY CONTROL SAMPLE: 2799529

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.4	100	90-110	
Nitrate as N	mg/L	1	0.96	96	90-110	
Sulfate	mg/L	12.5	12.8	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2799530 2799531

Parameter	Units	10415136001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Chloride	mg/L	1.3	12.5	12.5	13.6	13.6	99	99	90-110	0	20				
Nitrate as N	mg/L	0.28	1	1	1.3	1.3	104	103	90-110	1	20				
Sulfate	mg/L	2.7	12.5	12.5	15.4	15.3	101	100	90-110	1	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2799532 2799533

Parameter	Units	10414988001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Chloride	mg/L	218	250	250	457	454	96	95	90-110	1	20				
Nitrate as N	mg/L	23.0	20	20	44.1	43.8	106	104	90-110	1	20				
Sulfate	mg/L	968	250	250	1070	1060	41	37	90-110	1	20 M6				

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 515348

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10415136001

METHOD BLANK: 2802268

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 14:17	FS

LABORATORY CONTROL SAMPLE: 2802269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802270 2802271

Parameter	Units	10414755003		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	1.7	1	1	1	2.7	2.6	98	91	90-110	3	20	E		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802272 2802273

Parameter	Units	10415446001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	1	0.88	0.87	87	86	90-110	1	20	M1		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 516185 Analysis Method: EPA 410.4  
 QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
 Associated Lab Samples: 10415136001

METHOD BLANK: 2805657 Matrix: Water  
 Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	01/02/18 14:17	

LABORATORY CONTROL SAMPLE: 2805658

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	310	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805659 2805660

Parameter	Units	10415063001		MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chemical Oxygen Demand	mg/L	2860	2500	2500	5200	5290	94	97	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805661 2805662

Parameter	Units	10415061001		MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Chemical Oxygen Demand	mg/L	509	250	250	761	767	101	103	90-110	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

QC Batch: 134386

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10415136001

METHOD BLANK: 535605

Matrix: Water

Associated Lab Samples: 10415136001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	01/02/18 11:39	

LABORATORY CONTROL SAMPLE: 535606

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535607 535608

Parameter	Units	10414961011		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Total Organic Carbon	mg/L	2.2	25	25	27.8	28.2	102	104	80-120	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535609 535610

Parameter	Units	10414961016		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Total Organic Carbon	mg/L	28.2	25	25	51.7	52.0	94	95	80-120	1	20 E	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415136

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10415136001	MW5d-GW-121917	RSK 175	515357		
10415136001	MW5d-GW-121917	EPA 3010	515578	6010C Met	515940
10415136001	MW5d-GW-121917	EPA 7470A	515151	EPA 7470A	515471
10415136001	MW5d-GW-121917	SM 2320B	515839		
10415136001	MW5d-GW-121917	SM 2540C	515162		
10415136001	MW5d-GW-121917	SM 4500-S-2 D	97726		
10415136001	MW5d-GW-121917	EPA 300.0	514828		
10415136001	MW5d-GW-121917	EPA 353.2	515348		
10415136001	MW5d-GW-121917	EPA 410.4	516185	EPA 410.4	516242
10415136001	MW5d-GW-121917	SM 5310C	134386		

### REPORT OF LABORATORY ANALYSIS

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**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:**  
UPRR

**Project #:**

WO#: 10415136



10415136

**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     SpeedDee     Other: \_\_\_\_\_

**Tracking Number:** 7475 9636 4420

**Custody Seal on Cooler/Box Present?**  Yes     No    **Seals Intact?**  Yes     No    **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_    **Temp Blank?**  Yes     No

**Thermometer Used:**  151401163     G87A9155100842    **Type of Ice:**  Wet     Blue     None     Dry     Melted

**Cooler Temp Read (°C):** 0.5    **Cooler Temp Corrected (°C):** 0.2    **Biological Tissue Frozen?**  Yes     No     N/A

Temp should be above freezing to 6°C    **Correction Factor:** -0.3    **Date and Initials of Person Examining Contents:** MD 12/20/17

**USDA Regulated Soil**  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-1/2</u> <u>1/2</u> <u>1/2</u> <u>Zinc</u>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

**Field Data Required?**  Yes     No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1225</u> Temp: <u>0.5</u>	Corrected Temp: <u>0.2</u>	
Time: <u>1245</u> put in cooler		
Time: _____ Temp: _____	Corrected Temp: _____	

**Project Manager Review:** \_\_\_\_\_

JENNI GROSS

**Date:** 12/20/17

Note: Whenever there is a discrepancy affecting North Carolina compliance hold, incorrect preservative, out of temp, incorrect containers)

will be sent to the North Carolina DEHNR Certification Office ( i.e. out of

# Chain of Custody

**WO# : 12102948**  
 PM: HRZ      Due Date: 01/09/18  
 CLIENT: Pace WA

Workorder: 10415136      Workorder Name: 1497 Freeman WA-Grain Handling      Owner Received Date: 12/20/2017      Results Requested By: 1/5/2018

Report To		Subcontract To					Requested Analysis																														
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042					5632354 / 5310 TOC																														
Item		Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix													H2SO4	Preserved Containers										LAB USE ONLY							
1	MW5d-GW-121917	PS	12/19/2017 13:05	10415136001	Water	1																															
2																																					
3																																					
4																																					
5																																					

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	12/19/17 13:05	<i>[Signature]</i>	12/21/17 18:00	
2		12/19/17 22:00	<i>[Signature]</i>	12/21/17 08:00	
3					

Cooler Temperature on Receipt	5.1 °C	Custody Seal	<input checked="" type="checkbox"/> or N	Received on Ice	<input checked="" type="checkbox"/> or N	Samples Intact	<input checked="" type="checkbox"/> or N
-------------------------------	--------	--------------	--	-----------------	--	----------------	--

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: pace - milk

Project #:

**WO#: 12102948**  
 PM: HRZ Due Date: 01/09/18  
 CLIENT: Pace WA

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: koz pac Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 2.8 Cooler Temp Corrected °C: 3.1 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: JPC 12/22/17

Comments: WA 12/22/17

Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WA</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 12/22/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody \_\_\_\_\_

WO#: 2067653



Workorder: 10415136      Workorder Name: 1497 Freeman WA-Grain Handling      Owner Received Date: 12/20/2017      Results Requested By: 1/5/2018

Report To		Subcontract To					Requested Analysis																			
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">5636267 / 4500 Sulfide</div> <div style="border: 1px solid black; width: 100%; height: 100%;"></div> </div>																			
Preserved Containers:																										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other											LAB USE ONLY									
1	MW5d-GW-121917	PS	12/19/2017 13:05	10415136001	Water	1																				
2																										
3																										
4																										
5																										
												Comments														
Transfers	Released By	Date/Time	Received By	Date/Time																						
1	<i>[Signature]</i>	12/19/17 16:30	<i>[Signature]</i>	12/20/17																						
2	<i>[Signature]</i>	12/22/17 13:00	<i>[Signature]</i>	12/23/17																						
3																										
Cooler Temperature on Receipt		1.8 °C	Custody Seal		Y or N	Received on Ice		Y or N	Samples Intact			Y or N														

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

WO#: 2067653



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

Sample Condition Upon

PM: CMM

Due Date: 01/05/18

CLIENT: PASI-MINN

Pro, \_\_\_\_\_

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12-22-17 AJ

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present??	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Received Close to Hold Time



December 22, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

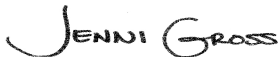
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415137

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 20, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415137

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10415137001	MW5d-GW-121917	Water	12/19/17 13:05	12/20/17 11:20
10415137002	Trip Blank	Water	12/19/17 00:00	12/20/17 11:20

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415137001	MW5d-GW-121917	EPA 8260B	DJB	83	PASI-M
10415137002	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 22, 2017

### General Information:

2 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 514975

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415444001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2801655)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2801656)
  - Acetone
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10415137

**Sample: MW5d-GW-121917**      **Lab ID: 10415137001**      Collected: 12/19/17 13:05      Received: 12/20/17 11:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/21/17 17:17	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/21/17 17:17	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/21/17 17:17	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/21/17 17:17	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/21/17 17:17	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/21/17 17:17	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/21/17 17:17	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/21/17 17:17	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/21/17 17:17	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/21/17 17:17	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/21/17 17:17	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/21/17 17:17	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/21/17 17:17	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/21/17 17:17	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/21/17 17:17	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/21/17 17:17	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/21/17 17:17	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/21/17 17:17	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/21/17 17:17	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/21/17 17:17	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/21/17 17:17	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/21/17 17:17	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/21/17 17:17	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/21/17 17:17	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/21/17 17:17	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/21/17 17:17	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/21/17 17:17	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/21/17 17:17	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/21/17 17:17	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/21/17 17:17	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/21/17 17:17	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/21/17 17:17	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/21/17 17:17	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/21/17 17:17	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/21/17 17:17	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/21/17 17:17	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/21/17 17:17	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/21/17 17:17	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/21/17 17:17	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/21/17 17:17	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/21/17 17:17	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/21/17 17:17	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/21/17 17:17	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

**Sample: MW5d-GW-121917**      **Lab ID: 10415137001**      Collected: 12/19/17 13:05      Received: 12/20/17 11:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/21/17 17:17	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/21/17 17:17	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/21/17 17:17	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/21/17 17:17	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/21/17 17:17	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/21/17 17:17	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/21/17 17:17	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/21/17 17:17	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		12/21/17 17:17	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/21/17 17:17	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/21/17 17:17	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/21/17 17:17	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/21/17 17:17	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/21/17 17:17	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/21/17 17:17	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/21/17 17:17	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/21/17 17:17	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/21/17 17:17	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/21/17 17:17	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/21/17 17:17	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/21/17 17:17	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/21/17 17:17	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/21/17 17:17	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/21/17 17:17	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/21/17 17:17	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/21/17 17:17	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/21/17 17:17	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/21/17 17:17	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/21/17 17:17	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/21/17 17:17	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/21/17 17:17	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		12/21/17 17:17	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		12/21/17 17:17	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		1		12/21/17 17:17	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10415137

**Sample: Trip Blank**      **Lab ID: 10415137002**      Collected: 12/19/17 00:00      Received: 12/20/17 11:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/21/17 14:56	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/21/17 14:56	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/21/17 14:56	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/21/17 14:56	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/21/17 14:56	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/21/17 14:56	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/21/17 14:56	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/21/17 14:56	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/21/17 14:56	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/21/17 14:56	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/21/17 14:56	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/21/17 14:56	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/21/17 14:56	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/21/17 14:56	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/21/17 14:56	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/21/17 14:56	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/21/17 14:56	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/21/17 14:56	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/21/17 14:56	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/21/17 14:56	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/21/17 14:56	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/21/17 14:56	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/21/17 14:56	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/21/17 14:56	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/21/17 14:56	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/21/17 14:56	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/21/17 14:56	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/21/17 14:56	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/21/17 14:56	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/21/17 14:56	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/21/17 14:56	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/21/17 14:56	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/21/17 14:56	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/21/17 14:56	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/21/17 14:56	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/21/17 14:56	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/21/17 14:56	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/21/17 14:56	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/21/17 14:56	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/21/17 14:56	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/21/17 14:56	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/21/17 14:56	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/21/17 14:56	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

**Sample: Trip Blank**      **Lab ID: 10415137002**      Collected: 12/19/17 00:00      Received: 12/20/17 11:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/21/17 14:56	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/21/17 14:56	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/21/17 14:56	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/21/17 14:56	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/21/17 14:56	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/21/17 14:56	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/21/17 14:56	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/21/17 14:56	91-20-3	
Styrene	<0.14	ug/L	1.0	0.14	1		12/21/17 14:56	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/21/17 14:56	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/21/17 14:56	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/21/17 14:56	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/21/17 14:56	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/21/17 14:56	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/21/17 14:56	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/21/17 14:56	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/21/17 14:56	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/21/17 14:56	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/21/17 14:56	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/21/17 14:56	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/21/17 14:56	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/21/17 14:56	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/21/17 14:56	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/21/17 14:56	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/21/17 14:56	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/21/17 14:56	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/21/17 14:56	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/21/17 14:56	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/21/17 14:56	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/21/17 14:56	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/21/17 14:56	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	104	%	75-137		1		12/21/17 14:56	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		12/21/17 14:56	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		12/21/17 14:56	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

QC Batch: 514975

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10415137001, 10415137002

METHOD BLANK: 2800305

Matrix: Water

Associated Lab Samples: 10415137001, 10415137002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/21/17 14:33	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/21/17 14:33	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/21/17 14:33	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/21/17 14:33	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/21/17 14:33	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/21/17 14:33	
1,2,3-Trichlorobenzene	ug/L	<0.14	1.0	0.14	12/21/17 14:33	MN
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/21/17 14:33	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/21/17 14:33	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	12/21/17 14:33	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/21/17 14:33	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/21/17 14:33	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/21/17 14:33	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/21/17 14:33	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/21/17 14:33	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/21/17 14:33	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/21/17 14:33	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/21/17 14:33	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/21/17 14:33	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/21/17 14:33	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/21/17 14:33	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/21/17 14:33	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/21/17 14:33	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/21/17 14:33	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/21/17 14:33	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/21/17 14:33	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/21/17 14:33	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/21/17 14:33	
Acetone	ug/L	<8.8	20.0	8.8	12/21/17 14:33	
Acrolein	ug/L	<4.8	10.0	4.8	12/21/17 14:33	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/21/17 14:33	
Benzene	ug/L	<0.13	0.50	0.13	12/21/17 14:33	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/21/17 14:33	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/21/17 14:33	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/21/17 14:33	
Bromoform	ug/L	<1.0	4.0	1.0	12/21/17 14:33	
Bromomethane	ug/L	<1.5	4.0	1.5	12/21/17 14:33	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/21/17 14:33	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/21/17 14:33	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

METHOD BLANK: 2800305

Matrix: Water

Associated Lab Samples: 10415137001, 10415137002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
Chloroethane	ug/L	<0.44	1.0	0.44	12/21/17 14:33	
Chloroform	ug/L	<0.46	1.0	0.46	12/21/17 14:33	
Chloromethane	ug/L	<1.1	4.0	1.1	12/21/17 14:33	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/21/17 14:33	
cis-1,3-Dichloropropene	ug/L	<0.12	1.0	0.12	12/21/17 14:33	MN
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/21/17 14:33	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/21/17 14:33	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/21/17 14:33	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/21/17 14:33	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/21/17 14:33	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/21/17 14:33	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/21/17 14:33	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/21/17 14:33	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/21/17 14:33	
n-Butylbenzene	ug/L	<0.13	1.0	0.13	12/21/17 14:33	MN
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/21/17 14:33	
Naphthalene	ug/L	<0.42	1.0	0.42	12/21/17 14:33	
o-Xylene	ug/L	<0.11	0.50	0.11	12/21/17 14:33	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/21/17 14:33	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/21/17 14:33	
Styrene	ug/L	<0.14	1.0	0.14	12/21/17 14:33	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/21/17 14:33	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/21/17 14:33	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/21/17 14:33	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/21/17 14:33	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/21/17 14:33	
Toluene	ug/L	<0.17	0.50	0.17	12/21/17 14:33	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/21/17 14:33	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	12/21/17 14:33	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/21/17 14:33	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/21/17 14:33	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/21/17 14:33	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/21/17 14:33	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/21/17 14:33	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/21/17 14:33	
1,2-Dichloroethane-d4 (S)	%	106	75-137		12/21/17 14:33	
4-Bromofluorobenzene (S)	%	102	75-125		12/21/17 14:33	
Toluene-d8 (S)	%	104	75-125		12/21/17 14:33	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

LABORATORY CONTROL SAMPLE: 2800306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.0	100	75-136	
1,1,1-Trichloroethane	ug/L	20	19.7	98	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	19.5	97	71-138	
1,1,2-Trichloroethane	ug/L	20	20.5	102	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	20.3	102	69-126	
1,1-Dichloroethane	ug/L	20	20.7	103	75-125	
1,1-Dichloroethene	ug/L	20	20.5	103	75-125	
1,1-Dichloropropene	ug/L	20	20.1	101	75-125	
1,2,3-Trichlorobenzene	ug/L	20	19.7	99	75-125	
1,2,3-Trichloropropane	ug/L	20	20.4	102	75-125	
1,2,4-Trichlorobenzene	ug/L	20	20.4	102	75-125	
1,2,4-Trimethylbenzene	ug/L	20	18.9	95	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	49.3	99	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.3	102	75-125	
1,2-Dichlorobenzene	ug/L	20	20.1	100	75-125	
1,2-Dichloroethane	ug/L	20	20.5	102	70-125	
1,2-Dichloroethene (Total)	ug/L	40	39.9	100	75-125	
1,2-Dichloropropane	ug/L	20	21.0	105	75-125	
1,3,5-Trimethylbenzene	ug/L	20	20.7	104	75-125	
1,3-Dichlorobenzene	ug/L	20	20.0	100	75-125	
1,3-Dichloropropane	ug/L	20	21.0	105	75-125	
1,4-Dichlorobenzene	ug/L	20	20.0	100	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	365	91	64-140	
2,2,4-Trimethylpentane	ug/L	20	21.3	107	68-125	
2,2-Dichloropropane	ug/L	20	20.4	102	70-131	
2-Butanone (MEK)	ug/L	100	100	100	69-125	
2-Chlorotoluene	ug/L	20	20.0	100	75-125	
2-Hexanone	ug/L	100	96.0	96	73-129	
4-Chlorotoluene	ug/L	20	21.2	106	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	105	73-125	
Acetone	ug/L	100	99.9	100	66-126	
Acrolein	ug/L	200	205	103	56-150	
Acrylonitrile	ug/L	200	203	101	68-129	
Benzene	ug/L	20	20.1	101	75-125	
Bromobenzene	ug/L	20	20.5	103	75-125	
Bromochloromethane	ug/L	20	20.1	101	75-126	
Bromodichloromethane	ug/L	20	20.8	104	75-133	
Bromoform	ug/L	20	18.9	94	62-142	
Bromomethane	ug/L	20	18.2	91	34-143	
Carbon disulfide	ug/L	20	19.4	97	71-125	
Carbon tetrachloride	ug/L	20	19.7	99	71-145	
Chlorobenzene	ug/L	20	20.8	104	75-125	
Chloroethane	ug/L	20	20.3	102	75-125	
Chloroform	ug/L	20	19.7	99	75-125	
Chloromethane	ug/L	20	19.9	99	54-125	
cis-1,2-Dichloroethene	ug/L	20	20.0	100	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.4	97	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

LABORATORY CONTROL SAMPLE: 2800306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	21.4	107	74-141	
Dibromomethane	ug/L	20	19.6	98	75-125	
Dichlorodifluoromethane	ug/L	20	20.1	101	59-130	
Dichlorofluoromethane	ug/L	20	21.0	105	75-125	
Diisopropyl ether	ug/L	20	20.9	104	69-125	
Ethyl-tert-butyl ether	ug/L	20	20.5	103	73-125	
Ethylbenzene	ug/L	20	20.5	103	75-125	
Hexachloro-1,3-butadiene	ug/L	20	22.1	111	75-131	
Isopropylbenzene (Cumene)	ug/L	20	21.2	106	75-125	
m&p-Xylene	ug/L	40	41.7	104	75-125	
Methyl-tert-butyl ether	ug/L	20	20.4	102	75-125	
Methylene Chloride	ug/L	20	19.9	100	73-125	
n-Butylbenzene	ug/L	20	19.3	97	75-125	
n-Propylbenzene	ug/L	20	20.4	102	75-125	
Naphthalene	ug/L	20	19.2	96	74-125	
o-Xylene	ug/L	20	20.3	101	75-125	
p-Isopropyltoluene	ug/L	20	20.9	105	75-125	
sec-Butylbenzene	ug/L	20	21.1	106	75-125	
Styrene	ug/L	20	19.2	96	75-125	
tert-Amylmethyl ether	ug/L	20	20.4	102	71-126	
tert-Butyl Alcohol	ug/L	200	189	94	69-131	
tert-Butylbenzene	ug/L	20	20.6	103	75-125	
Tetrachloroethene	ug/L	20	20.4	102	75-125	
Tetrahydrofuran	ug/L	200	210	105	65-127	
Toluene	ug/L	20	20.6	103	75-125	
trans-1,2-Dichloroethene	ug/L	20	19.9	99	75-125	
trans-1,3-Dichloropropene	ug/L	20	20.1	100	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	46.9	94	30-150	
Trichloroethene	ug/L	20	20.2	101	75-125	
Trichlorofluoromethane	ug/L	20	20.5	103	71-140	
Vinyl acetate	ug/L	20	19.2	96	68-137	
Vinyl chloride	ug/L	20	22.1	110	70-125	
Xylene (Total)	ug/L	60	62.0	103	75-125	
1,2-Dichloroethane-d4 (S)	%			101	75-137	
4-Bromofluorobenzene (S)	%			101	75-125	
Toluene-d8 (S)	%			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801655 2801656

Parameter	Units	2801655		2801656		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10415444001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	20	19.1	20.3	96	102	75-137	6	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	20	19.5	21.7	98	108	75-139	11	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	20	19.3	20.9	97	104	60-142	8	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20	19.2	20.9	96	105	75-128	9	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

Parameter	Units	2801655		2801656		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10415444001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	21.7	24.5	109	123	62-150	12	30		
1,1-Dichloroethane	ug/L	0.48J	20	20	20.5	23.2	100	113	70-129	12	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	20.6	23.3	103	116	67-141	12	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	20.8	22.8	104	114	64-144	9	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	20.3	21.7	102	108	66-139	6	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	20.9	20.8	105	104	69-134	1	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	20.1	21.8	101	109	65-138	8	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	18.9	20.2	95	101	65-143	7	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	49.2	50.3	98	101	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.8	21.3	94	106	74-129	12	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	19.7	20.9	99	104	68-135	6	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	19.0	21.3	95	106	73-125	11	30		
1,2-Dichloroethene (Total)	ug/L	0.59J	40	40	39.5	43.9	97	108	69-134	11	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	19.7	21.7	98	109	64-130	10	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.7	22.4	103	112	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.9	21.3	100	106	69-135	7	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	19.6	21.6	98	108	67-128	9	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	19.7	21.7	99	108	66-134	9	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	349	380	83	91	58-140	9	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	24.4	26.3	122	132	48-150	7	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	20.3	22.7	101	114	50-150	11	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	89.7	100	90	100	58-125	11	30		
2-Chlorotoluene	ug/L	<0.20	20	20	19.6	21.4	98	107	65-138	9	30		
2-Hexanone	ug/L	<2.5	100	100	90.2	94.6	90	95	61-134	5	30		
4-Chlorotoluene	ug/L	<0.13	20	20	21.4	22.4	107	112	68-135	5	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	97.8	104	98	104	61-130	7	30		
Acetone	ug/L	<8.8	100	100	152	164	152	164	51-140	7	30	M1	
Acrolein	ug/L	<4.8	200	200	202	222	101	111	48-150	9	30		
Acrylonitrile	ug/L	<4.9	200	200	187	203	93	101	55-134	8	30		
Benzene	ug/L	<0.13	20	20	19.4	21.9	97	109	63-132	12	30		
Bromobenzene	ug/L	<0.16	20	20	19.7	21.4	98	107	67-138	8	30		
Bromochloromethane	ug/L	<0.38	20	20	19.2	21.2	96	106	66-138	10	30		
Bromodichloromethane	ug/L	<0.20	20	20	19.8	21.7	99	108	75-137	9	30		
Bromoform	ug/L	<1.0	20	20	17.8	19.1	89	96	65-129	7	30		
Bromomethane	ug/L	<1.5	20	20	20.3	19.8	101	99	41-150	2	30		
Carbon disulfide	ug/L	<0.37	20	20	20.0	22.4	100	112	72-132	11	30		
Carbon tetrachloride	ug/L	<0.20	20	20	19.8	22.3	99	112	75-150	12	30		
Chlorobenzene	ug/L	<0.14	20	20	19.8	21.6	99	108	73-127	9	30		
Chloroethane	ug/L	<0.44	20	20	22.0	21.8	110	109	74-138	1	30		
Chloroform	ug/L	<0.46	20	20	18.6	20.8	93	104	74-125	11	30		
Chloromethane	ug/L	<1.1	20	20	22.7	21.4	113	107	58-129	6	30		
cis-1,2-Dichloroethene	ug/L	0.59	20	20	20.1	22.4	98	109	63-135	11	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	17.8	19.3	89	96	66-129	8	30		
Dibromochloromethane	ug/L	<0.13	20	20	19.4	20.7	97	103	75-133	7	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

Parameter	Units	2801655		2801656		MS % Rec	MSD % Rec	% Rec	Limits	RPD	Max RPD	Qual
		10415444001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.50	20	20	18.5	19.9	92	99	68-134	7	30	
Dichlorodifluoromethane	ug/L	<0.31	20	20	24.7	23.4	124	117	72-150	5	30	
Dichlorofluoromethane	ug/L	<0.38	20	20	22.4	21.3	111	106	75-129	5	30	
Diisopropyl ether	ug/L	<0.12	20	20	19.6	21.5	98	107	62-128	9	30	
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	19.3	21.3	96	107	63-132	10	30	
Ethylbenzene	ug/L	<0.14	20	20	19.9	21.7	100	108	72-130	8	30	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	23.5	24.9	117	125	71-150	6	30	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	20.5	21.9	102	110	70-136	7	30	
m&p-Xylene	ug/L	<0.24	40	40	39.9	44.0	100	110	64-142	10	30	
Methyl-tert-butyl ether	ug/L	<0.14	20	20	19.1	21.5	95	107	72-125	12	30	
Methylene Chloride	ug/L	<1.2	20	20	18.6	20.4	93	102	60-132	9	30	
n-Butylbenzene	ug/L	<0.13	20	20	19.8	21.2	99	106	60-150	7	30	
n-Propylbenzene	ug/L	<0.12	20	20	20.7	22.3	103	112	63-142	8	30	
Naphthalene	ug/L	<0.42	20	20	19.1	20.2	95	101	67-125	6	30	
o-Xylene	ug/L	<0.11	20	20	18.7	21.5	94	107	60-143	14	30	
p-Isopropyltoluene	ug/L	<0.14	20	20	21.1	23.2	105	116	64-146	10	30	
sec-Butylbenzene	ug/L	<0.12	20	20	21.6	23.2	108	116	67-144	7	30	
Styrene	ug/L	<0.14	20	20	18.6	20.5	93	103	67-136	10	30	
tert-Amylmethyl ether	ug/L	<0.12	20	20	19.2	21.3	96	107	60-134	11	30	
tert-Butyl Alcohol	ug/L	<2.2	200	200	180	195	90	97	56-146	8	30	
tert-Butylbenzene	ug/L	<0.15	20	20	20.6	22.5	103	113	68-135	9	30	
Tetrachloroethene	ug/L	<0.16	20	20	19.9	21.6	99	108	67-148	9	30	
Tetrahydrofuran	ug/L	<4.3	200	200	326	336	163	168	51-141	3	30	M1
Toluene	ug/L	<0.17	20	20	19.4	21.5	97	107	61-140	10	30	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	19.3	21.5	97	107	62-138	10	30	
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	18.2	19.7	91	98	67-134	8	30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	46.2	50.1	92	100	30-150	8	30	
Trichloroethene	ug/L	9.8	20	20	28.9	30.8	96	105	64-149	6	30	
Trichlorofluoromethane	ug/L	<0.13	20	20	24.0	23.3	120	116	75-150	3	30	
Vinyl acetate	ug/L	<1.5	20	20	18.5	21.2	93	106	49-143	14	30	
Vinyl chloride	ug/L	<0.096	20	20	25.5	23.3	127	117	75-133	9	30	
Xylene (Total)	ug/L	<0.24	60	60	58.6	65.5	98	109	63-142	11	30	
1,2-Dichloroethane-d4 (S)	%						100	103	75-137			
4-Bromofluorobenzene (S)	%						103	104	75-125			
Toluene-d8 (S)	%						100	102	75-125			

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415137

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415137

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10415137001	MW5d-GW-121917	EPA 8260B	514975		
10415137002	Trip Blank	EPA 8260B	514975		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10/15/17

Page: 1 of 1

**Section A**  
**Required Client Information:**  
 Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email:  
 Phone: Fax:  
 Requested Due Date: **10 Day Standard**

**Section B**  
**Required Project Information:**  
 Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # PEDD# 1497-39-Rev1  
 Project Name: Freeman WA-Grain Handling Facility  
 Project #: 1497

**Section C**  
**Invoice Information:**  
 Attention: Anne Walsh  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Contract# 758938  
 Pace Quote:  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447  
 State/Location:  
 WA / Freeman

ITEM #	MATRIX	CODE	SAMPLE ID	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	PRESERVATIVES	ANALYSES TEST	Y/N	DATE	TIME	DATE	TIME	TEMP IN C	Received on	Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
				START DATE	END DATE																
1	MW 5cd-CW-12F117	DW	MW 5cd-CW-12F117	12/19/17	15:30	G		3	Unpreserved	6010/470 TAL Dissolved Metals*		12/19/17	15:30	12/19/17	11:20	0.2	Y	Y	Y	Y	Y
2	Trip Blank	WT	Trip Blank	12/19/17	15:30	G		2	HCl	Low Level VOCs by 8260	X	12/19/17	15:30	12/19/17	11:20						
3		WT							HNO3												
4		WT							H2SO4												
5		WT							Unpreserved												
6		WT																			
7		WT																			
8		WT																			
9		WT																			
10		WT																			
11		WT																			
12		WT																			

**ADDITIONAL COMMENTS:**  
 Short hold analyses are in bold  
 \*Field filtered by client

**RELINQUISHED BY/AFFILIATION:** J. Wilson  
**DATE:** 12/19/17  
**TIME:** 15:30


**ACCEPTED BY/AFFILIATION:** [Signature]  
**DATE:** 12/29/17  
**TIME:** 11:20

**SAMPLER NAME AND SIGNATURE:** Jonathan Espinoza  
**PRINT Name of SAMPLER:** Jonathan Espinoza  
**SIGNATURE of SAMPLER:** [Signature]  
**DATE Signed:** 12/19/17

**Sample Condition Upon Receipt - ESI Tech Specs**

**Client Name:** UPRR **Project #:** \_\_\_\_\_

**WO# 10415137**



**Courier:**  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
**Tracking Number:** 7475 9636 4420

**Custody Seal on Cooler/Box Present?**  Yes  No **Seals Intact?**  Yes  No  
**Packing Material:**  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ **Temp Blank?**  Yes  No  
**Thermometer**  151401163  G87A9155100842 **Type of Ice:**  Wet  Blue  None  Dry  Melted

**Cooler Temp Read (°C):** 0.5 **Cooler Temp Corrected (°C):** 0.2 **Biological Tissue Frozen?**  Yes  No  NA  
**Temp should be above freezing to 6°C** **Correction Factor:** -0.3 **Date and Initials of Person Examining Contents:** MO 12/20/17

**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: (VOA) Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>2 trip blanks present</u>
Trip Blank Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>141537</u>	

**CLIENT NOTIFICATION/RESOLUTION** **Field Data Required?**  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1225</u> Temp: <u>0.5</u>	Corrected Temp: <u>0.2</u>	
Time: <u>1245</u> put in cooler		
Time: _____ Temp: _____	Corrected Temp: _____	

JENNI GROSS

Date: 12/20/17  
 n will be sent to the North Carolina DEHNR Certification Office ( i.e. out of

**Project Manager Review:** \_\_\_\_\_  
 Note: Whenever there is a discrepancy affecting North Carolina complia hold, incorrect preservative, out of temp, incorrect containers)

January 09, 2018

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

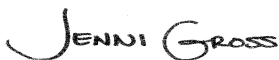
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415446

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
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## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415446

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10415446001	MW17D-GW-122117	Water	12/21/17 09:15	12/22/17 11:30
10415446002	MW19D-GW-122117	Water	12/21/17 10:15	12/22/17 11:30
10415446003	MW1D-GW-122117	Water	12/21/17 12:30	12/22/17 11:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415446001	MW17D-GW-122117	RSK 175	MLS	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10415446002	MW19D-GW-122117	RSK 175	MLS	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10415446003	MW1D-GW-122117	RSK 175	MLS	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10415446001</b>	<b>MW17D-GW-122117</b>					
RSK 175	Ethene	5.2J	ug/L	10.0	12/28/17 10:30	
RSK 175	Methane	2.7J	ug/L	10.0	12/28/17 10:30	
6010C Met	Aluminum, Dissolved	16.2J	ug/L	200	01/08/18 06:22	
6010C Met	Barium, Dissolved	59.1	ug/L	10.0	01/08/18 06:22	
6010C Met	Calcium, Dissolved	39500	ug/L	500	01/08/18 06:22	
6010C Met	Chromium, Dissolved	0.51J	ug/L	10.0	01/08/18 06:22	
6010C Met	Cobalt, Dissolved	1.4J	ug/L	10.0	01/08/18 06:22	
6010C Met	Iron, Dissolved	421	ug/L	50.0	01/08/18 06:22	
6010C Met	Magnesium, Dissolved	17400	ug/L	500	01/08/18 06:22	
6010C Met	Manganese, Dissolved	320	ug/L	5.0	01/08/18 06:22	
6010C Met	Potassium, Dissolved	15300	ug/L	2500	01/08/18 06:22	
6010C Met	Sodium, Dissolved	50300	ug/L	1000	01/08/18 06:22	
6010C Met	Thallium, Dissolved	8.1J	ug/L	20.0	01/08/18 06:22	
6010C Met	Vanadium, Dissolved	1.1J	ug/L	15.0	01/08/18 06:22	
SM 2320B	Alkalinity, Total as CaCO3	191	mg/L	5.0	12/30/17 11:55	
SM 2540C	Total Dissolved Solids	406	mg/L	10.0	12/26/17 15:39	
EPA 300.0	Chloride	34.4	mg/L	1.2	12/22/17 12:54	M1
EPA 300.0	Sulfate	76.4	mg/L	1.2	12/22/17 12:54	
EPA 410.4	Chemical Oxygen Demand	48.2J	mg/L	50.0	01/02/18 14:22	
SM 5310C	Total Organic Carbon	13.4	mg/L	1.0	01/05/18 17:29	
<b>10415446002</b>	<b>MW19D-GW-122117</b>					
RSK 175	Methane	2.9J	ug/L	10.0	12/28/17 10:45	
6010C Met	Barium, Dissolved	12.4	ug/L	10.0	01/08/18 06:49	
6010C Met	Calcium, Dissolved	40100	ug/L	500	01/08/18 06:49	
6010C Met	Copper, Dissolved	1.0J	ug/L	10.0	01/08/18 06:49	
6010C Met	Magnesium, Dissolved	17200	ug/L	500	01/08/18 06:49	
6010C Met	Manganese, Dissolved	5.1	ug/L	5.0	01/08/18 06:49	
6010C Met	Potassium, Dissolved	3990	ug/L	2500	01/08/18 06:49	
6010C Met	Sodium, Dissolved	14500	ug/L	1000	01/08/18 06:49	
6010C Met	Thallium, Dissolved	8.5J	ug/L	20.0	01/08/18 06:49	
6010C Met	Vanadium, Dissolved	5.9J	ug/L	15.0	01/08/18 06:49	
6010C Met	Zinc, Dissolved	4.1J	ug/L	20.0	01/08/18 06:49	
SM 2320B	Alkalinity, Total as CaCO3	166	mg/L	5.0	12/30/17 11:59	
SM 2540C	Total Dissolved Solids	276	mg/L	10.0	12/26/17 15:39	
EPA 300.0	Chloride	7.3	mg/L	1.2	12/22/17 15:34	
EPA 300.0	Nitrate as N	4.7	mg/L	0.10	12/22/17 15:34	
EPA 300.0	Sulfate	23.9	mg/L	1.2	12/22/17 15:34	
EPA 353.2	Nitrogen, NO2 plus NO3	4.7	mg/L	0.10	12/23/17 15:10	
SM 5310C	Total Organic Carbon	0.60J	mg/L	1.0	01/05/18 17:43	
<b>10415446003</b>	<b>MW1D-GW-122117</b>					
RSK 175	Methane	5.0J	ug/L	10.0	12/28/17 10:52	
6010C Met	Aluminum, Dissolved	96.5J	ug/L	200	01/08/18 06:53	
6010C Met	Barium, Dissolved	66.9	ug/L	10.0	01/08/18 06:53	
6010C Met	Calcium, Dissolved	47400	ug/L	500	01/08/18 06:53	
6010C Met	Copper, Dissolved	1.9J	ug/L	10.0	01/08/18 06:53	
6010C Met	Iron, Dissolved	131	ug/L	50.0	01/08/18 06:53	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415446003</b>	<b>MW1D-GW-122117</b>					
6010C Met	Magnesium, Dissolved	11700	ug/L	500	01/08/18 06:53	
6010C Met	Manganese, Dissolved	70.5	ug/L	5.0	01/08/18 06:53	
6010C Met	Potassium, Dissolved	1260J	ug/L	2500	01/08/18 06:53	
6010C Met	Sodium, Dissolved	10500	ug/L	1000	01/08/18 06:53	
6010C Met	Thallium, Dissolved	6.8J	ug/L	20.0	01/08/18 06:53	
6010C Met	Vanadium, Dissolved	1.7J	ug/L	15.0	01/08/18 06:53	
6010C Met	Zinc, Dissolved	2.6J	ug/L	20.0	01/08/18 06:53	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	199	mg/L	5.0	12/30/17 12:03	
SM 2540C	Total Dissolved Solids	230	mg/L	10.0	12/26/17 15:39	
EPA 300.0	Chloride	1.8	mg/L	1.2	12/22/17 12:21	B
EPA 300.0	Nitrate as N	0.12	mg/L	0.10	12/22/17 12:21	
EPA 300.0	Sulfate	3.7	mg/L	1.2	12/22/17 12:21	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	0.12	mg/L	0.020	12/28/17 13:49	
EPA 410.4	Chemical Oxygen Demand	34.5J	mg/L	50.0	01/02/18 14:22	
SM 5310C	Total Organic Carbon	0.78J	mg/L	1.0	01/05/18 18:25	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 516116

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415580004,10415690001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2805422)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 97726

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415136001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 420841)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

Analyte Comments:

QC Batch: 97726

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- MW1D-GW-122117 (Lab ID: 10415446003)
- Sulfide, Total

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

### General Information:

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 515243

B: Analyte was detected in the associated method blank.

- BLANK for HBN 515243 [WETA/338 (Lab ID: 2801650)
- Chloride

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515243

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415446001,12102838004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2801652)
  - Chloride
  - Nitrate as N
  - Sulfate
- MS (Lab ID: 2801666)
  - Chloride
- MSD (Lab ID: 2801653)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2801667)
  - Chloride

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515348

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414755003,10415446001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2802272)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802273)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

Analyte Comments:

QC Batch: 515348

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2802270)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802271)
  - Nitrogen, NO2 plus NO3

QC Batch: 515865

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2804277)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2804278)
  - Nitrogen, NO2 plus NO3

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

**Sample:** MW17D-GW-122117    **Lab ID:** 10415446001    Collected: 12/21/17 09:15    Received: 12/22/17 11:30    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/28/17 10:30	74-84-0	
Ethene	5.2J	ug/L	10.0	0.68	1		12/28/17 10:30	74-85-1	
Methane	2.7J	ug/L	10.0	1.1	1		12/28/17 10:30	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met    Preparation Method: EPA 3010									
Aluminum, Dissolved	16.2J	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 06:22	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 06:22	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 06:22	7440-38-2	
Barium, Dissolved	59.1	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 06:22	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 06:22	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 06:22	7440-43-9	
Calcium, Dissolved	39500	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 06:22	7440-70-2	
Chromium, Dissolved	0.51J	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 06:22	7440-47-3	
Cobalt, Dissolved	1.4J	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 06:22	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 06:22	7440-50-8	
Iron, Dissolved	421	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 06:22	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 06:22	7439-92-1	
Magnesium, Dissolved	17400	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 06:22	7439-95-4	
Manganese, Dissolved	320	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 06:22	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 06:22	7440-02-0	
Potassium, Dissolved	15300	ug/L	2500	126	1	01/03/18 10:27	01/08/18 06:22	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 06:22	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 06:22	7440-22-4	
Sodium, Dissolved	50300	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 06:22	7440-23-5	
Thallium, Dissolved	8.1J	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 06:22	7440-28-0	
Vanadium, Dissolved	1.1J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 06:22	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 06:22	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A    Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:32	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	191	mg/L	5.0	1.4	1		12/30/17 11:55		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	406	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/26/17 13:49	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	34.4	mg/L	1.2	0.14	1		12/22/17 12:54	16887-00-6	M1
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		12/22/17 12:54	14797-55-8	
Sulfate	76.4	mg/L	1.2	0.27	1		12/22/17 12:54	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Sample:** MW17D-GW-122117      **Lab ID:** 10415446001      Collected: 12/21/17 09:15      Received: 12/22/17 11:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		12/23/17 13:55		M1
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>48.2J</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:22		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>13.4</b>	mg/L	1.0	0.20	1		01/05/18 17:29	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

Sample: **MW19D-GW-122117** Lab ID: **10415446002** Collected: 12/21/17 10:15 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/28/17 10:45	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/28/17 10:45	74-85-1	
Methane	2.9J	ug/L	10.0	1.1	1		12/28/17 10:45	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 06:49	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 06:49	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 06:49	7440-38-2	
Barium, Dissolved	12.4	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 06:49	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 06:49	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 06:49	7440-43-9	
Calcium, Dissolved	40100	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 06:49	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 06:49	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 06:49	7440-48-4	
Copper, Dissolved	1.0J	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 06:49	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 06:49	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 06:49	7439-92-1	
Magnesium, Dissolved	17200	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 06:49	7439-95-4	
Manganese, Dissolved	5.1	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 06:49	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 06:49	7440-02-0	
Potassium, Dissolved	3990	ug/L	2500	126	1	01/03/18 10:27	01/08/18 06:49	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 06:49	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 06:49	7440-22-4	
Sodium, Dissolved	14500	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 06:49	7440-23-5	
Thallium, Dissolved	8.5J	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 06:49	7440-28-0	
Vanadium, Dissolved	5.9J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 06:49	7440-62-2	
Zinc, Dissolved	4.1J	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 06:49	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:35	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	166	mg/L	5.0	1.4	1		12/30/17 11:59		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	276	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/26/17 13:50	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.3	mg/L	1.2	0.14	1		12/22/17 15:34	16887-00-6	
Nitrate as N	4.7	mg/L	0.10	0.0079	1		12/22/17 15:34	14797-55-8	
Sulfate	23.9	mg/L	1.2	0.27	1		12/22/17 15:34	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Sample: MW19D-GW-122117**      **Lab ID: 10415446002**      Collected: 12/21/17 10:15      Received: 12/22/17 11:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.7</b>	mg/L	0.10	0.037	5		12/23/17 15:10		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:22		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.60J</b>	mg/L	1.0	0.20	1		01/05/18 17:43	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

**Sample:** MW1D-GW-122117      **Lab ID:** 10415446003      Collected: 12/21/17 12:30      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/28/17 10:52	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/28/17 10:52	74-85-1	
Methane	5.0J	ug/L	10.0	1.1	1		12/28/17 10:52	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	96.5J	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 06:53	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 06:53	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 06:53	7440-38-2	
Barium, Dissolved	66.9	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 06:53	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 06:53	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 06:53	7440-43-9	
Calcium, Dissolved	47400	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 06:53	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 06:53	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 06:53	7440-48-4	
Copper, Dissolved	1.9J	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 06:53	7440-50-8	
Iron, Dissolved	131	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 06:53	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 06:53	7439-92-1	
Magnesium, Dissolved	11700	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 06:53	7439-95-4	
Manganese, Dissolved	70.5	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 06:53	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 06:53	7440-02-0	
Potassium, Dissolved	1260J	ug/L	2500	126	1	01/03/18 10:27	01/08/18 06:53	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 06:53	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 06:53	7440-22-4	
Sodium, Dissolved	10500	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 06:53	7440-23-5	
Thallium, Dissolved	6.8J	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 06:53	7440-28-0	
Vanadium, Dissolved	1.7J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 06:53	7440-62-2	
Zinc, Dissolved	2.6J	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 06:53	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:42	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	199	mg/L	5.0	1.4	1		12/30/17 12:03		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	230	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.025	mg/L	0.10	0.025	5		12/26/17 13:52	18496-25-8	D3
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.8	mg/L	1.2	0.14	1		12/22/17 12:21	16887-00-6	B
Nitrate as N	0.12	mg/L	0.10	0.0079	1		12/22/17 12:21	14797-55-8	
Sulfate	3.7	mg/L	1.2	0.27	1		12/22/17 12:21	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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**Sample: MW1D-GW-122117**      **Lab ID: 10415446003**      Collected: 12/21/17 12:30      Received: 12/22/17 11:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.12</b>	mg/L	0.020	0.0075	1		12/28/17 13:49		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>34.5J</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:22		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.78J</b>	mg/L	1.0	0.20	1		01/05/18 18:25	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 515792

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2804037

Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/28/17 10:17	
Ethene	ug/L	<0.68	10.0	0.68	12/28/17 10:17	
Methane	ug/L	4.2J	10.0	1.1	12/28/17 10:17	

LABORATORY CONTROL SAMPLE & LCSD: 2804038

2804039

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	112	107	99	94	85-115	5	20	
Ethene	ug/L	106	106	102	100	96	85-115	4	20	
Methane	ug/L	60.7	60.8	59.7	100	98	85-115	2	20	

SAMPLE DUPLICATE: 2804040

Parameter	Units	10415446001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	<4.9	<4.9		20	
Ethene	ug/L	5.2J	5.6J		20	
Methane	ug/L	2.7J	3.2J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 516182

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2805645

Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	01/03/18 18:28	

LABORATORY CONTROL SAMPLE: 2805646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805647 2805648

Parameter	Units	2805647		2805648		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Mercury, Dissolved	ug/L	<0.062	5	5	5.0	5.2	100	103	80-120	3	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 516201 Analysis Method: 6010C Met  
QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2805718 Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	01/08/18 06:13	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	01/08/18 06:13	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	01/08/18 06:13	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	01/08/18 06:13	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	01/08/18 06:13	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	01/08/18 06:13	
Calcium, Dissolved	ug/L	<24.7	500	24.7	01/08/18 06:13	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	01/08/18 06:13	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	01/08/18 06:13	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	01/08/18 06:13	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	01/08/18 06:13	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	01/08/18 06:13	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	01/08/18 06:13	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	01/08/18 06:13	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	01/08/18 06:13	
Potassium, Dissolved	ug/L	<126	2500	126	01/08/18 06:13	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	01/08/18 06:13	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	01/08/18 06:13	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	01/08/18 06:13	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	01/08/18 06:13	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	01/08/18 06:13	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	01/08/18 06:13	

LABORATORY CONTROL SAMPLE: 2805719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19100	96	80-120	
Antimony, Dissolved	ug/L	1000	940	94	80-120	
Arsenic, Dissolved	ug/L	1000	917	92	80-120	
Barium, Dissolved	ug/L	1000	941	94	80-120	
Beryllium, Dissolved	ug/L	1000	937	94	80-120	
Cadmium, Dissolved	ug/L	1000	932	93	80-120	
Calcium, Dissolved	ug/L	20000	18200	91	80-120	
Chromium, Dissolved	ug/L	1000	924	92	80-120	
Cobalt, Dissolved	ug/L	1000	927	93	80-120	
Copper, Dissolved	ug/L	1000	916	92	80-120	
Iron, Dissolved	ug/L	20000	18500	92	80-120	
Lead, Dissolved	ug/L	1000	938	94	80-120	
Magnesium, Dissolved	ug/L	20000	18600	93	80-120	
Manganese, Dissolved	ug/L	1000	937	94	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

LABORATORY CONTROL SAMPLE: 2805719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	926	93	80-120	
Potassium, Dissolved	ug/L	20000	18400	92	80-120	
Selenium, Dissolved	ug/L	1000	980	98	80-120	
Silver, Dissolved	ug/L	500	459	92	80-120	
Sodium, Dissolved	ug/L	20000	18400	92	80-120	
Thallium, Dissolved	ug/L	1000	906	91	80-120	
Vanadium, Dissolved	ug/L	1000	910	91	80-120	
Zinc, Dissolved	ug/L	1000	930	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805720 2805721

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10415446001 Result	Spike Conc.	Spike Conc.	MS Result							
Aluminum, Dissolved	ug/L	16.2J	20000	20000	19900	20100	99	101	75-125	1	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	969	997	97	100	75-125	3	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	955	969	95	96	75-125	1	20	
Barium, Dissolved	ug/L	59.1	1000	1000	1020	1040	96	98	75-125	2	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	970	983	97	98	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	958	968	96	97	75-125	1	20	
Calcium, Dissolved	ug/L	39500	20000	20000	59000	59600	97	100	75-125	1	20	
Chromium, Dissolved	ug/L	0.51J	1000	1000	944	956	94	95	75-125	1	20	
Cobalt, Dissolved	ug/L	1.4J	1000	1000	942	953	94	95	75-125	1	20	
Copper, Dissolved	ug/L	<0.83	1000	1000	956	969	96	97	75-125	1	20	
Iron, Dissolved	ug/L	421	20000	20000	19300	19600	95	96	75-125	2	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	950	962	95	96	75-125	1	20	
Magnesium, Dissolved	ug/L	17400	20000	20000	37000	37500	98	100	75-125	1	20	
Manganese, Dissolved	ug/L	320	1000	1000	1270	1290	95	97	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	937	948	94	95	75-125	1	20	
Potassium, Dissolved	ug/L	15300	20000	20000	35400	36000	100	103	75-125	2	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1000	1010	100	101	75-125	1	20	
Silver, Dissolved	ug/L	<0.27	500	500	469	475	94	95	75-125	1	20	
Sodium, Dissolved	ug/L	50300	20000	20000	69800	71200	98	105	75-125	2	20	
Thallium, Dissolved	ug/L	8.1J	1000	1000	924	938	92	93	75-125	1	20	
Vanadium, Dissolved	ug/L	1.1J	1000	1000	941	952	94	95	75-125	1	20	
Zinc, Dissolved	ug/L	<1.8	1000	1000	932	942	93	94	75-125	1	20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 516116 Analysis Method: SM 2320B  
 QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
 Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2805419 Matrix: Water  
 Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	12/30/17 10:50	

LABORATORY CONTROL SAMPLE & LCSD: 2805420 2805421

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	40.4	41.2	101	103	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805422 2805423

Parameter	Units	10415580004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	430	40	40	452	462	54	80	80-120	2	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805424 2805425

Parameter	Units	10415690001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	142	40	40	184	178	105	89	80-120	3	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 515446

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2802642

Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/26/17 15:39	

LABORATORY CONTROL SAMPLE: 2802643

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	966	97	80-120	

SAMPLE DUPLICATE: 2802644

Parameter	Units	10415459001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	229	231	1	10	

SAMPLE DUPLICATE: 2802645

Parameter	Units	10415459002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	229	241	5	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 97726

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 420838

Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/26/17 13:43	

LABORATORY CONTROL SAMPLE: 420839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.20	101	90-110	

MATRIX SPIKE SAMPLE: 420841

Parameter	Units	10415136001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.042	21	75-125	M1

SAMPLE DUPLICATE: 420840

Parameter	Units	10415136001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 515243 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2801650 Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.27J	1.2	0.14	12/22/17 14:55	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/22/17 14:55	
Sulfate	mg/L	<0.27	1.2	0.27	12/22/17 14:55	

LABORATORY CONTROL SAMPLE: 2801651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	
Nitrate as N	mg/L	1	0.96	96	90-110	
Sulfate	mg/L	12.5	12.8	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801652 2801653

Parameter	Units	12102838004 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec							
Chloride	mg/L	10.1	12.5	20.8	21.5	86	91	90-110	3	20	M1			
Nitrate as N	mg/L	5.9	1	5.9	6.3	-1	38	90-110	6	20	M1			
Sulfate	mg/L	36.1	12.5	42.7	45.4	53	74	90-110	6	20	M1			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801666 2801667

Parameter	Units	10415446001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	MSD % Rec							
Chloride	mg/L	34.4	12.5	42.8	40.6	67	50	90-110	5	20	M1			
Nitrate as N	mg/L	<0.0079	1	0.94	0.94	94	94	90-110	0	20				
Sulfate	mg/L	76.4	62.5	135	136	94	96	90-110	1	20				

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415446

QC Batch: 515348 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10415446001, 10415446002

METHOD BLANK: 2802268 Matrix: Water  
Associated Lab Samples: 10415446001, 10415446002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 14:17	FS

LABORATORY CONTROL SAMPLE: 2802269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802270 2802271

Parameter	Units	10414755003 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Nitrogen, NO2 plus NO3	mg/L	1.7	1	1	2.7	2.6	98	91	90-110	3	20	E	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802272 2802273

Parameter	Units	10415446001 Result	MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result							
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	0.88	0.87	87	86	90-110	1	20	M1	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 515865

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Associated Lab Samples: 10415446003

METHOD BLANK: 2804275

Matrix: Water

Associated Lab Samples: 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	0.0094J	0.020	0.0075	12/28/17 13:25	FS

LABORATORY CONTROL SAMPLE: 2804276

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2804277 2804278

Parameter	Units	2804277		2804278		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	5.8	5	5	10.7	10.7	97	97	90-110	0	20 E

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 516185

Analysis Method: EPA 410.4

QC Batch Method: EPA 410.4

Analysis Description: 410.4 COD

Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 2805657

Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	01/02/18 14:17	

LABORATORY CONTROL SAMPLE: 2805658

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	310	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805659 2805660

Parameter	Units	10415063001		2805659		2805660		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	2860	2500	2500	5200	5290	94	97	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805661 2805662

Parameter	Units	10415061001		2805661		2805662		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chemical Oxygen Demand	mg/L	509	250	250	761	767	101	103	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

QC Batch: 134481

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10415446001, 10415446002, 10415446003

METHOD BLANK: 535823

Matrix: Water

Associated Lab Samples: 10415446001, 10415446002, 10415446003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	01/05/18 14:26	

LABORATORY CONTROL SAMPLE: 535824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535825 535826

Parameter	Units	10415459004		535826		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Total Organic Carbon	mg/L	1.2J	100	100	104	103	103	102	103	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535827 535828

Parameter	Units	10415446002		535828		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Total Organic Carbon	mg/L	0.60J	25	25	26.2	26.4	102	103	103	80-120	1	20	

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415446

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415446

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10415446001	MW17D-GW-122117	RSK 175	515792		
10415446002	MW19D-GW-122117	RSK 175	515792		
10415446003	MW1D-GW-122117	RSK 175	515792		
10415446001	MW17D-GW-122117	EPA 3010	516201	6010C Met	516458
10415446002	MW19D-GW-122117	EPA 3010	516201	6010C Met	516458
10415446003	MW1D-GW-122117	EPA 3010	516201	6010C Met	516458
10415446001	MW17D-GW-122117	EPA 7470A	516182	EPA 7470A	516497
10415446002	MW19D-GW-122117	EPA 7470A	516182	EPA 7470A	516497
10415446003	MW1D-GW-122117	EPA 7470A	516182	EPA 7470A	516497
10415446001	MW17D-GW-122117	SM 2320B	516116		
10415446002	MW19D-GW-122117	SM 2320B	516116		
10415446003	MW1D-GW-122117	SM 2320B	516116		
10415446001	MW17D-GW-122117	SM 2540C	515446		
10415446002	MW19D-GW-122117	SM 2540C	515446		
10415446003	MW1D-GW-122117	SM 2540C	515446		
10415446001	MW17D-GW-122117	SM 4500-S-2 D	97726		
10415446002	MW19D-GW-122117	SM 4500-S-2 D	97726		
10415446003	MW1D-GW-122117	SM 4500-S-2 D	97726		
10415446001	MW17D-GW-122117	EPA 300.0	515243		
10415446002	MW19D-GW-122117	EPA 300.0	515243		
10415446003	MW1D-GW-122117	EPA 300.0	515243		
10415446001	MW17D-GW-122117	EPA 353.2	515348		
10415446002	MW19D-GW-122117	EPA 353.2	515348		
10415446003	MW1D-GW-122117	EPA 353.2	515865		
10415446001	MW17D-GW-122117	EPA 410.4	516185	EPA 410.4	516242
10415446002	MW19D-GW-122117	EPA 410.4	516185	EPA 410.4	516242
10415446003	MW1D-GW-122117	EPA 410.4	516185	EPA 410.4	516242
10415446001	MW17D-GW-122117	SM 5310C	134481		
10415446002	MW19D-GW-122117	SM 5310C	134481		
10415446003	MW1D-GW-122117	SM 5310C	134481		

**REPORT OF LABORATORY ANALYSIS**

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10415446

**Section A**  
Required Client Information:

**Section B**  
Required Project Information:

**Section C**  
Invoice Information:

Page: 1 Of 1

Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone:		Purchase Order # PEDD# 1497-39-Rev1		Pace Quote: Contract# 758938	
Requested Due Date: 10 Day Standard		Project Name: Freeman WA-Grain Handling Facility		Pace Project Manager: Jennifer Gross	
Fax:		Project #: 1497		Pace Profile #: 36447	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					Analyses Test Y/N	Requested Analysis: Filtered (Y/N)										Regulatory Agency
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate		Other	Low Level VOCs by 8260	6010/7470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	
1	MW17D-GW-122117			W-G		12/1/17	9:15			8	4	2	1			X	X	X	X	X	X	X	X	X	X	WA		
2	MW19D-GW-122117						10:15																			WA		
3	MW1D-GW-122117						12:30																			WA		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	J. Ar KHAM	12-21-17	15:00	M. Pace	12/22/17	11:30	2.7 Y Y Y
*Field filtered by client							

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Jordan Espinoza					
SIGNATURE of SAMPLER:	J. Li					
DATE Signed:		12/21/17				



Document Name:  
**Sample Condition Upon Receipt Form - ESI**

Document No.:  
**F-MN-L-210-rev.24**

Document Revised: 18Dec2017  
Page 1 of 2

Issuing Authority:  
Pace Minnesota Quality Office

Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name:  
**UPRR**

Project #:

**WO# : 10415446**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: **7475 9635 9177**

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional:      Proj. Due Date:      Proj. Name:  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: **PB**      Temp Blank?  Yes  No  
 Thermometer Used:  151401163      Type of Ice:  Wet  Blue  None  Dry  Melted  
 G87A9155100842

Cooler Temp Read (°C): **3.0**      Cooler Temp Corrected (°C): **2.7**      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: **-0.3**      Date and Initials of Person Examining Contents: **MD 12/22/17**

USDA Regulated Soil ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <b>no ms/msd</b>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>WT</b>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH      Positive for Res. Chlorine? Y N Sample # <b>1-3: 1/2 1/2 1/2</b>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1140</b>	Temp: <b>3.0</b>	Corrected Temp: <b>2.7</b>
Time: <b>1200</b>	put in cooler	
Time:	Temp:	Corrected Temp:

Project Manager Review:

**JENNI GROSS**

Date: **12/22/17**

Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers) form will be sent to the North Carolina DEHNR Certification Office (i.e. out of

# Chain of Custody

**WO#: 12102995**  
 PM: HRZ Due Date: 01/09/18  
 CLIENT: Pace WA

Page 39 of 42

Workorder: 10415446 Workorder Name: 1497 Freeman WA-Grain Handling Owner Received Date: 12/22/2017 Results Requested By: 1/9/2018

Report To		Subcontract To					Requested Analysis													
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																		
							5632354 / 5310 IOC													
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	H2SO4	Preserved Containers				LAB USE ONLY									
1	MW17D-GW-122117	PS	12/21/2017 09:15	10415446001	Water	1					X									
2	MW19D-GW-122117	PS	12/21/2017 10:15	10415446002	Water	1					X									
3	MW1D-GW-122117	PS	12/21/2017 12:30	10415446003	Water	1					X									
4																				
5																				
Transfers											Comments									
Transfers	Released By	Date/Time	Received By	Date/Time																
1	<i>Greg Paul Pace</i>	<i>12/22/17 1615</i>																		
2	<i>D. C. Copp</i>	<i>12-27 23:00</i>	<i>M. U. [Signature]</i>	<i>12/26/17 0800</i>																
3																				
Cooler Temperature on Receipt <i>3.4</i> °C		Custody Seal <input checked="" type="checkbox"/> or N			Received on Ice <input checked="" type="checkbox"/> or N			Samples Intact <input checked="" type="checkbox"/> or N												

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MN Project #: **WO#: 12102995**

**WO#: 12102995**  
 PM: HRZ Due Date: 01/09/18  
 CLIENT: Pace WA

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.1 Cooler Temp Corrected °C: 3.4 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 12-23-17 DL

Comments: W 12/26/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Angela Lind Date: 12/26/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody \_\_\_\_\_

WO#: 2067686



Workorder: 10415446

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 12/22/2017

Results Requested By: 1/9/2018

Report To		Subcontract To					Requested Analysis																															
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					5636267 / 4500 Sulfide																															
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers														LAB USE ONLY																		
						Other																																
1	MW17D-GW-122117	PS	12/21/2017 09:15	10415446001	Water	1																																
2	MW19D-GW-122117	PS	12/21/2017 10:15	10415446002	Water	1																																
3	MW1D-GW-122117	PS	12/21/2017 12:30	10415446003	Water	1																																
4																																						
5																																						
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																																
1		<i>Kim Neil Pace</i>	12/22/17 650	<i>Joe Pace</i>	12-23-17 945																																	
2		<i>RECEIVED</i>	12-23-17 945	<i>Joe Pace</i>	12-23-17 945																																	
3																																						
Cooler Temperature on Receipt		4.0 °C		Custody Seal		Y or N		Received on ice		Y or N		Samples Intact											Y or N															

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon

# WO#: 2067686

PM: CMM

Due Date: 01/09/18

CLIENT: PASI-MINN

Prc.

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:

- Therm Fisher IR 5
- Therm Fisher IR 6
- Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12-23-17/AA

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

December 29, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

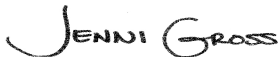
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415455

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10415455001	MW17D-GW-122117	Water	12/21/17 09:15	12/22/17 11:30
10415455002	MW19D-GW-122117	Water	12/21/17 10:15	12/22/17 11:30
10415455003	MW1D-GW-122117	Water	12/21/17 12:30	12/22/17 11:30
10415455004	Trip Blank	Water	12/21/17 00:00	12/22/17 11:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415455001	MW17D-GW-122117	EPA 8260B	DJB	83	PASI-M
10415455002	MW19D-GW-122117	EPA 8260B	DJB	83	PASI-M
10415455003	MW1D-GW-122117	EPA 8260B	DJB	83	PASI-M
10415455004	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415455001</b>	<b>MW17D-GW-122117</b>					
EPA 8260B	Carbon disulfide	2.2	ug/L	1.0	12/26/17 19:07	
<b>10415455002</b>	<b>MW19D-GW-122117</b>					
EPA 8260B	Carbon disulfide	2.6	ug/L	2.0	12/26/17 19:54	
EPA 8260B	Carbon tetrachloride	402	ug/L	1.0	12/26/17 19:54	
EPA 8260B	Chloroform	19.4	ug/L	2.0	12/26/17 19:54	

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 29, 2017

### General Information:

4 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- MW17D-GW-122117 (Lab ID: 10415455001)
- MW19D-GW-122117 (Lab ID: 10415455002)
- MW1D-GW-122117 (Lab ID: 10415455003)
- Trip Blank (Lab ID: 10415455004)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515429

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Sample: MW17D-GW-122117 Lab ID: 10415455001 Collected: 12/21/17 09:15 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 19:07	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 19:07	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 19:07	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 19:07	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:07	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:07	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 19:07	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 19:07	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:07	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 19:07	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 19:07	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 19:07	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 19:07	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 19:07	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 19:07	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 19:07	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:07	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 19:07	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 19:07	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 19:07	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 19:07	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 19:07	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 19:07	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 19:07	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 19:07	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 19:07	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 19:07	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 19:07	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 19:07	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 19:07	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 19:07	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 19:07	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 19:07	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 19:07	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 19:07	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 19:07	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 19:07	74-83-9	
Carbon disulfide	2.2	ug/L	1.0	0.37	1		12/26/17 19:07	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/26/17 19:07	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 19:07	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 19:07	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 19:07	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 19:07	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Sample: MW17D-GW-122117 Lab ID: 10415455001 Collected: 12/21/17 09:15 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 19:07	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 19:07	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 19:07	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 19:07	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 19:07	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 19:07	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 19:07	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 19:07	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 19:07	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 19:07	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 19:07	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 19:07	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 19:07	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 19:07	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 19:07	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 19:07	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 19:07	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 19:07	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 19:07	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 19:07	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 19:07	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 19:07	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 19:07	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 19:07	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 19:07	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 19:07	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 19:07	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 19:07	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 19:07	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 19:07	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 19:07	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	109	%	75-137		1		12/26/17 19:07	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		12/26/17 19:07	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		12/26/17 19:07	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10415455

Sample: MW19D-GW-122117 Lab ID: 10415455002 Collected: 12/21/17 10:15 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.29	ug/L	1.0	0.29	2		12/26/17 19:54	630-20-6	
1,1,1-Trichloroethane	<0.30	ug/L	1.0	0.30	2		12/26/17 19:54	71-55-6	
1,1,2,2-Tetrachloroethane	<0.38	ug/L	1.0	0.38	2		12/26/17 19:54	79-34-5	
1,1,2-Trichloroethane	<0.44	ug/L	1.0	0.44	2		12/26/17 19:54	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.55	ug/L	2.0	0.55	2		12/26/17 19:54	76-13-1	
1,1-Dichloroethane	<0.29	ug/L	1.0	0.29	2		12/26/17 19:54	75-34-3	
1,1-Dichloroethene	<0.36	ug/L	1.0	0.36	2		12/26/17 19:54	75-35-4	
1,1-Dichloropropene	<0.35	ug/L	1.0	0.35	2		12/26/17 19:54	563-58-6	
1,2,3-Trichlorobenzene	<0.29	ug/L	2.0	0.29	2		12/26/17 19:54	87-61-6	L2
1,2,3-Trichloropropane	<1.3	ug/L	8.0	1.3	2		12/26/17 19:54	96-18-4	
1,2,4-Trichlorobenzene	<0.36	ug/L	1.0	0.36	2		12/26/17 19:54	120-82-1	
1,2,4-Trimethylbenzene	<0.20	ug/L	2.0	0.20	2		12/26/17 19:54	95-63-6	
1,2-Dibromo-3-chloropropane	<2.1	ug/L	8.0	2.1	2		12/26/17 19:54	96-12-8	
1,2-Dibromoethane (EDB)	<0.34	ug/L	1.0	0.34	2		12/26/17 19:54	106-93-4	
1,2-Dichlorobenzene	<0.42	ug/L	1.0	0.42	2		12/26/17 19:54	95-50-1	
1,2-Dichloroethane	<0.30	ug/L	1.0	0.30	2		12/26/17 19:54	107-06-2	
1,2-Dichloroethene (Total)	<0.82	ug/L	2.0	0.82	2		12/26/17 19:54	540-59-0	
1,2-Dichloropropane	<1.2	ug/L	8.0	1.2	2		12/26/17 19:54	78-87-5	
1,3,5-Trimethylbenzene	<0.36	ug/L	1.0	0.36	2		12/26/17 19:54	108-67-8	
1,3-Dichlorobenzene	<0.32	ug/L	1.0	0.32	2		12/26/17 19:54	541-73-1	
1,3-Dichloropropane	<0.26	ug/L	1.0	0.26	2		12/26/17 19:54	142-28-9	
1,4-Dichlorobenzene	<0.21	ug/L	1.0	0.21	2		12/26/17 19:54	106-46-7	
1,4-Dioxane (p-Dioxane)	<45.2	ug/L	400	45.2	2		12/26/17 19:54	123-91-1	
2,2,4-Trimethylpentane	<2.6	ug/L	8.0	2.6	2		12/26/17 19:54	540-84-1	
2,2-Dichloropropane	<0.79	ug/L	2.0	0.79	2		12/26/17 19:54	594-20-7	
2-Butanone (MEK)	<4.8	ug/L	10.0	4.8	2		12/26/17 19:54	78-93-3	
2-Chlorotoluene	<0.41	ug/L	1.0	0.41	2		12/26/17 19:54	95-49-8	
2-Hexanone	<5.0	ug/L	10.0	5.0	2		12/26/17 19:54	591-78-6	
4-Chlorotoluene	<0.26	ug/L	1.0	0.26	2		12/26/17 19:54	106-43-4	
4-Methyl-2-pentanone (MIBK)	<1.1	ug/L	10.0	1.1	2		12/26/17 19:54	108-10-1	
Acetone	<17.7	ug/L	40.0	17.7	2		12/26/17 19:54	67-64-1	
Acrolein	<9.7	ug/L	20.0	9.7	2		12/26/17 19:54	107-02-8	
Acrylonitrile	<9.8	ug/L	20.0	9.8	2		12/26/17 19:54	107-13-1	
Benzene	<0.25	ug/L	1.0	0.25	2		12/26/17 19:54	71-43-2	
Bromobenzene	<0.31	ug/L	1.0	0.31	2		12/26/17 19:54	108-86-1	
Bromochloromethane	<0.76	ug/L	2.0	0.76	2		12/26/17 19:54	74-97-5	
Bromodichloromethane	<0.40	ug/L	1.0	0.40	2		12/26/17 19:54	75-27-4	
Bromoform	<2.1	ug/L	8.0	2.1	2		12/26/17 19:54	75-25-2	
Bromomethane	<3.1	ug/L	8.0	3.1	2		12/26/17 19:54	74-83-9	
Carbon disulfide	2.6	ug/L	2.0	0.74	2		12/26/17 19:54	75-15-0	
Carbon tetrachloride	402	ug/L	1.0	0.40	2		12/26/17 19:54	56-23-5	
Chlorobenzene	<0.27	ug/L	1.0	0.27	2		12/26/17 19:54	108-90-7	
Chloroethane	<0.88	ug/L	2.0	0.88	2		12/26/17 19:54	75-00-3	
Chloroform	19.4	ug/L	2.0	0.92	2		12/26/17 19:54	67-66-3	
Chloromethane	<2.2	ug/L	8.0	2.2	2		12/26/17 19:54	74-87-3	
Dibromochloromethane	<0.27	ug/L	1.0	0.27	2		12/26/17 19:54	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

**Sample: MW19D-GW-122117**      **Lab ID: 10415455002**      Collected: 12/21/17 10:15      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>									
Analytical Method: EPA 8260B									
Dibromomethane	<1.0	ug/L	2.0	1.0	2		12/26/17 19:54	74-95-3	
Dichlorodifluoromethane	<0.63	ug/L	2.0	0.63	2		12/26/17 19:54	75-71-8	
Dichlorofluoromethane	<0.77	ug/L	2.0	0.77	2		12/26/17 19:54	75-43-4	
Diisopropyl ether	<0.25	ug/L	2.0	0.25	2		12/26/17 19:54	108-20-3	
Ethyl-tert-butyl ether	<0.26	ug/L	1.0	0.26	2		12/26/17 19:54	637-92-3	
Ethylbenzene	<0.27	ug/L	1.0	0.27	2		12/26/17 19:54	100-41-4	
Hexachloro-1,3-butadiene	<0.96	ug/L	2.0	0.96	2		12/26/17 19:54	87-68-3	
Isopropylbenzene (Cumene)	<0.28	ug/L	1.0	0.28	2		12/26/17 19:54	98-82-8	
Methyl-tert-butyl ether	<0.29	ug/L	1.0	0.29	2		12/26/17 19:54	1634-04-4	
Methylene Chloride	<2.3	ug/L	8.0	2.3	2		12/26/17 19:54	75-09-2	
Naphthalene	<0.84	ug/L	2.0	0.84	2		12/26/17 19:54	91-20-3	L2
Styrene	<0.29	ug/L	2.0	0.29	2		12/26/17 19:54	100-42-5	
Tetrachloroethene	<0.32	ug/L	1.0	0.32	2		12/26/17 19:54	127-18-4	
Tetrahydrofuran	<8.6	ug/L	20.0	8.6	2		12/26/17 19:54	109-99-9	
Toluene	<0.34	ug/L	1.0	0.34	2		12/26/17 19:54	108-88-3	
Trichloroethene	<0.36	ug/L	0.80	0.36	2		12/26/17 19:54	79-01-6	
Trichlorofluoromethane	<0.26	ug/L	1.0	0.26	2		12/26/17 19:54	75-69-4	
Vinyl acetate	<3.0	ug/L	20.0	3.0	2		12/26/17 19:54	108-05-4	
Vinyl chloride	<0.19	ug/L	0.40	0.19	2		12/26/17 19:54	75-01-4	
Xylene (Total)	<0.49	ug/L	3.0	0.49	2		12/26/17 19:54	1330-20-7	
cis-1,2-Dichloroethene	<0.40	ug/L	1.0	0.40	2		12/26/17 19:54	156-59-2	
cis-1,3-Dichloropropene	<0.23	ug/L	2.0	0.23	2		12/26/17 19:54	10061-01-5	
m&p-Xylene	<0.49	ug/L	2.0	0.49	2		12/26/17 19:54	179601-23-1	
n-Butylbenzene	<0.27	ug/L	2.0	0.27	2		12/26/17 19:54	104-51-8	
n-Propylbenzene	<0.25	ug/L	1.0	0.25	2		12/26/17 19:54	103-65-1	
o-Xylene	<0.22	ug/L	1.0	0.22	2		12/26/17 19:54	95-47-6	
p-Isopropyltoluene	<0.28	ug/L	1.0	0.28	2		12/26/17 19:54	99-87-6	
sec-Butylbenzene	<0.25	ug/L	1.0	0.25	2		12/26/17 19:54	135-98-8	
tert-Amylmethyl ether	<0.23	ug/L	1.0	0.23	2		12/26/17 19:54	994-05-8	
tert-Butyl Alcohol	<4.4	ug/L	20.0	4.4	2		12/26/17 19:54	75-65-0	
tert-Butylbenzene	<0.29	ug/L	1.0	0.29	2		12/26/17 19:54	98-06-6	
trans-1,2-Dichloroethene	<0.42	ug/L	1.0	0.42	2		12/26/17 19:54	156-60-5	
trans-1,3-Dichloropropene	<0.27	ug/L	2.0	0.27	2		12/26/17 19:54	10061-02-6	
trans-1,4-Dichloro-2-butene	<5.7	ug/L	20.0	5.7	2		12/26/17 19:54	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	109	%	75-137		2		12/26/17 19:54	17060-07-0	
Toluene-d8 (S)	104	%	75-125		2		12/26/17 19:54	2037-26-5	
4-Bromofluorobenzene (S)	102	%	75-125		2		12/26/17 19:54	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

**Sample: MW1D-GW-122117**      **Lab ID: 10415455003**      Collected: 12/21/17 12:30      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 19:30	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 19:30	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 19:30	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 19:30	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:30	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:30	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 19:30	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 19:30	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:30	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 19:30	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 19:30	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 19:30	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 19:30	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 19:30	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 19:30	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 19:30	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 19:30	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 19:30	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 19:30	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 19:30	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 19:30	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 19:30	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 19:30	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 19:30	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 19:30	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 19:30	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 19:30	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 19:30	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 19:30	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 19:30	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 19:30	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 19:30	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 19:30	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 19:30	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 19:30	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 19:30	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 19:30	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/26/17 19:30	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/26/17 19:30	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 19:30	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 19:30	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 19:30	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 19:30	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

**Sample: MW1D-GW-122117**      **Lab ID: 10415455003**      Collected: 12/21/17 12:30      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>									
Analytical Method: EPA 8260B									
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 19:30	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 19:30	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 19:30	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 19:30	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 19:30	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 19:30	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 19:30	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 19:30	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 19:30	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 19:30	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 19:30	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 19:30	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 19:30	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 19:30	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 19:30	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 19:30	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 19:30	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 19:30	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 19:30	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 19:30	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 19:30	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 19:30	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 19:30	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 19:30	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 19:30	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 19:30	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 19:30	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 19:30	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 19:30	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 19:30	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 19:30	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		12/26/17 19:30	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		12/26/17 19:30	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		12/26/17 19:30	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10415455

Sample: Trip Blank      Lab ID: 10415455004      Collected: 12/21/17 00:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 16:23	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 16:23	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 16:23	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 16:23	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:23	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:23	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 16:23	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 16:23	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:23	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 16:23	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 16:23	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 16:23	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 16:23	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 16:23	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 16:23	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 16:23	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:23	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 16:23	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 16:23	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 16:23	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 16:23	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 16:23	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 16:23	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 16:23	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 16:23	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 16:23	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 16:23	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 16:23	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 16:23	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 16:23	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 16:23	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 16:23	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 16:23	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 16:23	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 16:23	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 16:23	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 16:23	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/26/17 16:23	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/26/17 16:23	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 16:23	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 16:23	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 16:23	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 16:23	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

**Sample: Trip Blank**      **Lab ID: 10415455004**      Collected: 12/21/17 00:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 16:23	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 16:23	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 16:23	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 16:23	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 16:23	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 16:23	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 16:23	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 16:23	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 16:23	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 16:23	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 16:23	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 16:23	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 16:23	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 16:23	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 16:23	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 16:23	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 16:23	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 16:23	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 16:23	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 16:23	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 16:23	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 16:23	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 16:23	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 16:23	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 16:23	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 16:23	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 16:23	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 16:23	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 16:23	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 16:23	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 16:23	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	106	%	75-137		1		12/26/17 16:23	17060-07-0	
Toluene-d8 (S)	102	%	75-125		1		12/26/17 16:23	2037-26-5	
4-Bromofluorobenzene (S)	106	%	75-125		1		12/26/17 16:23	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

QC Batch: 515429 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10415455001, 10415455002, 10415455003, 10415455004

METHOD BLANK: 2802588 Matrix: Water  
Associated Lab Samples: 10415455001, 10415455002, 10415455003, 10415455004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/26/17 15:36	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/26/17 15:36	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/26/17 15:36	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/26/17 15:36	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,2,3-Trichlorobenzene	ug/L	<0.14	1.0	0.14	12/26/17 15:36	MN
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/26/17 15:36	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	12/26/17 15:36	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/26/17 15:36	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/26/17 15:36	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/26/17 15:36	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/26/17 15:36	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/26/17 15:36	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/26/17 15:36	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/26/17 15:36	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/26/17 15:36	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/26/17 15:36	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/26/17 15:36	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/26/17 15:36	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/26/17 15:36	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/26/17 15:36	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/26/17 15:36	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/26/17 15:36	
Acetone	ug/L	<8.8	20.0	8.8	12/26/17 15:36	
Acrolein	ug/L	<4.8	10.0	4.8	12/26/17 15:36	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/26/17 15:36	
Benzene	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/26/17 15:36	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/26/17 15:36	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/26/17 15:36	
Bromoform	ug/L	<1.0	4.0	1.0	12/26/17 15:36	
Bromomethane	ug/L	<1.5	4.0	1.5	12/26/17 15:36	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/26/17 15:36	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/26/17 15:36	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

METHOD BLANK: 2802588

Matrix: Water

Associated Lab Samples: 10415455001, 10415455002, 10415455003, 10415455004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
Chloroethane	ug/L	<0.44	1.0	0.44	12/26/17 15:36	
Chloroform	ug/L	<0.46	1.0	0.46	12/26/17 15:36	
Chloromethane	ug/L	<1.1	4.0	1.1	12/26/17 15:36	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/26/17 15:36	
cis-1,3-Dichloropropene	ug/L	<0.12	1.0	0.12	12/26/17 15:36	MN
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/26/17 15:36	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/26/17 15:36	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/26/17 15:36	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/26/17 15:36	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/26/17 15:36	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/26/17 15:36	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/26/17 15:36	
n-Butylbenzene	ug/L	<0.13	1.0	0.13	12/26/17 15:36	MN
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/26/17 15:36	
Naphthalene	ug/L	<0.42	1.0	0.42	12/26/17 15:36	
o-Xylene	ug/L	<0.11	0.50	0.11	12/26/17 15:36	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/26/17 15:36	
Styrene	ug/L	<0.14	1.0	0.14	12/26/17 15:36	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/26/17 15:36	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/26/17 15:36	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/26/17 15:36	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/26/17 15:36	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/26/17 15:36	
Toluene	ug/L	<0.17	0.50	0.17	12/26/17 15:36	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/26/17 15:36	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	12/26/17 15:36	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/26/17 15:36	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/26/17 15:36	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/26/17 15:36	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/26/17 15:36	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/26/17 15:36	
1,2-Dichloroethane-d4 (S)	%	104	75-137		12/26/17 15:36	
4-Bromofluorobenzene (S)	%	106	75-125		12/26/17 15:36	
Toluene-d8 (S)	%	102	75-125		12/26/17 15:36	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

LABORATORY CONTROL SAMPLE & LCSD: 2802589		2802590									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	16.8	16.9	84	84	75-136	1	30		
1,1,1-Trichloroethane	ug/L	20	17.5	16.9	87	85	75-129	3	30		
1,1,2,2-Tetrachloroethane	ug/L	20	15.6	16.0	78	80	71-138	3	30		
1,1,2-Trichloroethane	ug/L	20	17.7	18.0	89	90	75-125	2	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.4	16.8	87	84	69-126	4	30		
1,1-Dichloroethane	ug/L	20	18.4	17.8	92	89	75-125	3	30		
1,1-Dichloroethene	ug/L	20	17.4	17.0	87	85	75-125	2	30		
1,1-Dichloropropene	ug/L	20	18.5	17.8	92	89	75-125	4	30		
1,2,3-Trichlorobenzene	ug/L	20	14.3	16.1	71	81	75-125	12	30	L2	
1,2,3-Trichloropropane	ug/L	20	16.4	16.8	82	84	75-125	2	30		
1,2,4-Trichlorobenzene	ug/L	20	16.0	16.8	80	84	75-125	5	30		
1,2,4-Trimethylbenzene	ug/L	20	15.8	15.6	79	78	75-125	1	30		
1,2-Dibromo-3-chloropropane	ug/L	50	36.0	39.8	72	80	71-130	10	30		
1,2-Dibromoethane (EDB)	ug/L	20	17.6	18.3	88	91	75-125	4	30		
1,2-Dichlorobenzene	ug/L	20	16.4	16.6	82	83	75-125	1	30		
1,2-Dichloroethane	ug/L	20	18.5	17.7	92	89	70-125	4	30		
1,2-Dichloroethene (Total)	ug/L	40	35.9	34.4	90	86	75-125	4	30		
1,2-Dichloropropane	ug/L	20	17.7	17.9	88	90	75-125	2	30		
1,3,5-Trimethylbenzene	ug/L	20	16.8	17.0	84	85	75-125	1	30		
1,3-Dichlorobenzene	ug/L	20	16.1	16.2	81	81	75-125	1	30		
1,3-Dichloropropane	ug/L	20	17.9	17.5	89	87	75-125	2	30		
1,4-Dichlorobenzene	ug/L	20	16.3	16.5	81	83	75-125	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	326	282	82	71	64-140	14	30		
2,2,4-Trimethylpentane	ug/L	20	18.6	18.4	93	92	68-125	1	30		
2,2-Dichloropropane	ug/L	20	18.8	18.4	94	92	70-131	2	30		
2-Butanone (MEK)	ug/L	100	81.3	81.4	81	81	69-125	0	30		
2-Chlorotoluene	ug/L	20	16.4	16.2	82	81	75-125	2	30		
2-Hexanone	ug/L	100	73.5	75.6	73	76	73-129	3	30		
4-Chlorotoluene	ug/L	20	17.3	17.6	86	88	75-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	83.8	85.7	84	86	73-125	2	30		
Acetone	ug/L	100	85.8	89.5	86	89	66-126	4	30		
Acrolein	ug/L	200	172	170	86	85	56-150	1	30		
Acrylonitrile	ug/L	200	173	170	86	85	68-129	2	30		
Benzene	ug/L	20	18.3	17.6	91	88	75-125	4	30		
Bromobenzene	ug/L	20	16.9	16.9	84	85	75-125	0	30		
Bromochloromethane	ug/L	20	17.9	17.8	90	89	75-126	0	30		
Bromodichloromethane	ug/L	20	17.9	18.3	90	92	75-133	2	30		
Bromoform	ug/L	20	15.4	15.9	77	79	62-142	3	30		
Bromomethane	ug/L	20	19.1	19.1	95	95	34-143	0	30		
Carbon disulfide	ug/L	20	17.1	16.4	85	82	71-125	4	30		
Carbon tetrachloride	ug/L	20	18.0	17.1	90	86	71-145	5	30		
Chlorobenzene	ug/L	20	17.2	17.4	86	87	75-125	2	30		
Chloroethane	ug/L	20	17.9	18.0	90	90	75-125	0	30		
Chloroform	ug/L	20	18.0	17.1	90	86	75-125	5	30		
Chloromethane	ug/L	20	19.8	19.0	99	95	54-125	4	30		
cis-1,2-Dichloroethene	ug/L	20	18.0	17.7	90	89	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	20	17.2	16.8	86	84	75-125	2	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Parameter	Units	Spike Conc.	2802590		LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
			LCS Result	LCSD Result						
Dibromochloromethane	ug/L	20	17.7	17.7	88	89	74-141	0	30	
Dibromomethane	ug/L	20	15.9	16.7	80	83	75-125	5	30	
Dichlorodifluoromethane	ug/L	20	17.4	16.6	87	83	59-130	5	30	
Dichlorofluoromethane	ug/L	20	18.7	17.6	93	88	75-125	6	30	
Diisopropyl ether	ug/L	20	18.6	18.4	93	92	69-125	1	30	
Ethyl-tert-butyl ether	ug/L	20	18.6	18.5	93	92	73-125	1	30	
Ethylbenzene	ug/L	20	17.7	17.4	88	87	75-125	2	30	
Hexachloro-1,3-butadiene	ug/L	20	16.9	17.2	85	86	75-131	2	30	
Isopropylbenzene (Cumene)	ug/L	20	17.6	17.6	88	88	75-125	0	30	
m&p-Xylene	ug/L	40	35.6	35.7	89	89	75-125	0	30	
Methyl-tert-butyl ether	ug/L	20	18.0	18.0	90	90	75-125	0	30	
Methylene Chloride	ug/L	20	17.9	17.4	90	87	73-125	3	30	
n-Butylbenzene	ug/L	20	15.8	15.6	79	78	75-125	1	30	
n-Propylbenzene	ug/L	20	16.8	16.6	84	83	75-125	1	30	
Naphthalene	ug/L	20	13.8	15.4	69	77	74-125	12	30 L2	
o-Xylene	ug/L	20	17.8	17.1	89	86	75-125	4	30	
p-Isopropyltoluene	ug/L	20	17.2	16.5	86	83	75-125	4	30	
sec-Butylbenzene	ug/L	20	17.1	17.1	85	85	75-125	0	30	
Styrene	ug/L	20	16.9	16.8	84	84	75-125	0	30	
tert-Amylmethyl ether	ug/L	20	18.3	17.6	91	88	71-126	4	30	
tert-Butyl Alcohol	ug/L	200	156	177	78	89	69-131	13	30	
tert-Butylbenzene	ug/L	20	17.1	16.6	86	83	75-125	3	30	
Tetrachloroethene	ug/L	20	17.1	16.7	86	83	75-125	3	30	
Tetrahydrofuran	ug/L	200	178	189	89	95	65-127	6	30	
Toluene	ug/L	20	17.5	17.8	88	89	75-125	1	30	
trans-1,2-Dichloroethene	ug/L	20	17.9	16.7	90	84	75-125	7	30	
trans-1,3-Dichloropropene	ug/L	20	17.5	17.7	87	88	75-125	1	30	
trans-1,4-Dichloro-2-butene	ug/L	50	41.8	43.1	84	86	30-150	3	30	
Trichloroethene	ug/L	20	16.6	16.6	83	83	75-125	1	30	
Trichlorofluoromethane	ug/L	20	17.6	17.0	88	85	71-140	3	30	
Vinyl acetate	ug/L	20	19.1	19.0	95	95	68-137	0	30	
Vinyl chloride	ug/L	20	19.2	18.5	96	92	70-125	4	30	
Xylene (Total)	ug/L	60	53.4	52.9	89	88	75-125	1	30	
1,2-Dichloroethane-d4 (S)	%				106	104	75-137			
4-Bromofluorobenzene (S)	%				99	100	75-125			
Toluene-d8 (S)	%				107	106	75-125			

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 515429

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415455

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10415455001	MW17D-GW-122117	EPA 8260B	515429		
10415455002	MW19D-GW-122117	EPA 8260B	515429		
10415455003	MW1D-GW-122117	EPA 8260B	515429		
10415455004	Trip Blank	EPA 8260B	515429		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10415455

Page: 1 of 1

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh	
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR	
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221	
Phone:		Purchase Order # PEDD# 1497-39-Rev1		Pace Quote: Contract# 758938	
Fax:		Project Name: Freeman WA-Grain Handling Facility		Pace Project Manager: Jennifer Gross	
Requested Due Date: 10 Day Standard		Project #: 1497		Pace Profile #: 36447	
Regulatory Agency:					
State / Location:					
WA / Freeman					

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives					Y/N	Requested Analysis: Filtered (Y/N)	Y															
						START DATE	START TIME	END DATE	END TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate				Other														
1	MW170-GW-122117			WTG	12-21-17	9:15				3			3																				001	
2	MW190-GW-122117					10:15				3			3																				002	
3	MW10-GW-122117					12:30				3			3																				003	
4	Trip Blank					-				2			2																				004	
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	<i>[Signature]</i>	12-21-17	15:00	<i>[Signature]</i> Pace	12/22/17	11:30	22	Y	Y	Y
*Field filtered by client										

<b>SAMPLER NAME AND SIGNATURE</b>		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	<i>Jonathan Espinoza</i>					
SIGNATURE of SAMPLER:	<i>[Signature]</i>	DATE Signed:	12/21/17			

**Sample Condition Upon Receipt - ESI Tech Specs**

Client Name: UPRR

Project #: \_\_\_\_\_

**WO# : 10415455**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7475 9635 9177

Custody Seal on Cooler/Box Present?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB  
 Thermometer Used:  151401163  G87A9155100842  
 Type of Ice:  Wet  Blue  None  Dry  Melted  
 Temp Blank?  Yes  No

Cooler Temp Read (°C): 3.0 Cooler Temp Corrected (°C): 2.7 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 5°C Correction Factor: -0.3 Date and Initials of Person Examining Contents: MD 12/22/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>no ms/msd</u>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15. <u>2 Present</u>
Pace Trip Blank Lot # (if purchased): <u>141537</u>		

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution:

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1140</u> Temp: <u>3.0</u>	Corrected Temp: <u>2.7</u>
Time: <u>1200</u> put in cooler	
Time: _____ Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_ Date: 12/22/17  
 Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers) **JENNI GROSS**  
 will be sent to the North Carolina DEHNR Certification Office (i.e. out of

January 09, 2018

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

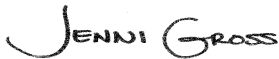
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415459

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415459

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
Montana Certificate #CERT0103  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10415459001	MW6d-GW-122017	Water	12/20/17 10:00	12/22/17 11:30
10415459002	MW15d-GW-122017	Water	12/20/17 11:35	12/22/17 11:30
10415459003	MW9d-GW-122017	Water	12/20/17 13:25	12/22/17 11:30
10415459004	MW16d-GW-122017	Water	12/20/17 15:10	12/22/17 11:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415459

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415459001	MW6d-GW-122017	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10415459002	MW15d-GW-122017	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10415459003	MW9d-GW-122017	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10415459004	MW16d-GW-122017	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	SMS2	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415459001</b>	<b>MW6d-GW-122017</b>					
RSK 175	Methane	4.4J	ug/L	10.0	12/26/17 12:24	
6010C Met	Barium, Dissolved	15.0	ug/L	10.0	01/08/18 06:57	
6010C Met	Calcium, Dissolved	32100	ug/L	500	01/08/18 06:57	
6010C Met	Magnesium, Dissolved	14500	ug/L	500	01/08/18 06:57	
6010C Met	Potassium, Dissolved	6970	ug/L	2500	01/08/18 06:57	
6010C Met	Sodium, Dissolved	18200	ug/L	1000	01/08/18 06:57	
6010C Met	Vanadium, Dissolved	13.0J	ug/L	15.0	01/08/18 06:57	
SM 2320B	Alkalinity, Total as CaCO3	178	mg/L	5.0	12/28/17 13:18	
SM 2540C	Total Dissolved Solids	229	mg/L	10.0	12/26/17 15:39	
EPA 300.0	Chloride	3.4	mg/L	1.2	12/22/17 14:25	
EPA 300.0	Nitrate as N	0.53	mg/L	0.10	12/22/17 14:25	H3
EPA 300.0	Sulfate	5.5	mg/L	1.2	12/22/17 14:25	
EPA 353.2	Nitrogen, NO2 plus NO3	0.58	mg/L	0.020	12/23/17 14:03	FS
SM 5310C	Total Organic Carbon	0.63J	mg/L	2.0	01/08/18 17:52	
<b>10415459002</b>	<b>MW15d-GW-122017</b>					
RSK 175	Methane	4.3J	ug/L	10.0	12/26/17 13:01	
6010C Met	Aluminum, Dissolved	150J	ug/L	200	01/08/18 07:01	
6010C Met	Barium, Dissolved	13.1	ug/L	10.0	01/08/18 07:01	
6010C Met	Calcium, Dissolved	36600	ug/L	500	01/08/18 07:01	
6010C Met	Cobalt, Dissolved	1.2J	ug/L	10.0	01/08/18 07:01	
6010C Met	Iron, Dissolved	211	ug/L	50.0	01/08/18 07:01	
6010C Met	Magnesium, Dissolved	13800	ug/L	500	01/08/18 07:01	
6010C Met	Manganese, Dissolved	20.5	ug/L	5.0	01/08/18 07:01	
6010C Met	Potassium, Dissolved	2560	ug/L	2500	01/08/18 07:01	
6010C Met	Sodium, Dissolved	15100	ug/L	1000	01/08/18 07:01	
6010C Met	Thallium, Dissolved	5.1J	ug/L	20.0	01/08/18 07:01	
6010C Met	Vanadium, Dissolved	10.3J	ug/L	15.0	01/08/18 07:01	
SM 2320B	Alkalinity, Total as CaCO3	169	mg/L	5.0	12/28/17 13:21	
SM 2540C	Total Dissolved Solids	229	mg/L	10.0	12/26/17 15:39	
SM 4500-S-2 D	Sulfide, Total	0.0060J	mg/L	0.020	12/26/17 13:46	
EPA 300.0	Chloride	3.0	mg/L	1.2	12/22/17 14:40	
EPA 300.0	Nitrate as N	1.9	mg/L	0.10	12/22/17 14:40	H1
EPA 300.0	Sulfate	6.1	mg/L	1.2	12/22/17 14:40	
EPA 353.2	Nitrogen, NO2 plus NO3	2.0	mg/L	0.020	12/23/17 14:04	
SM 5310C	Total Organic Carbon	2.2J	mg/L	4.0	01/05/18 15:50	
<b>10415459003</b>	<b>MW9d-GW-122017</b>					
RSK 175	Methane	4.4J	ug/L	10.0	12/26/17 13:08	
6010C Met	Barium, Dissolved	27.0	ug/L	10.0	01/08/18 07:05	
6010C Met	Calcium, Dissolved	48600	ug/L	500	01/08/18 07:05	
6010C Met	Copper, Dissolved	1.4J	ug/L	10.0	01/08/18 07:05	
6010C Met	Magnesium, Dissolved	13800	ug/L	500	01/08/18 07:05	
6010C Met	Manganese, Dissolved	4.0J	ug/L	5.0	01/08/18 07:05	
6010C Met	Potassium, Dissolved	2070J	ug/L	2500	01/08/18 07:05	
6010C Met	Sodium, Dissolved	13800	ug/L	1000	01/08/18 07:05	
6010C Met	Thallium, Dissolved	6.2J	ug/L	20.0	01/08/18 07:05	
6010C Met	Vanadium, Dissolved	6.5J	ug/L	15.0	01/08/18 07:05	

### REPORT OF LABORATORY ANALYSIS

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## SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415459003</b>	<b>MW9d-GW-122017</b>					
6010C Met	Zinc, Dissolved	2.1J	ug/L	20.0	01/08/18 07:05	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	152	mg/L	5.0	12/28/17 13:54	
SM 2540C	Total Dissolved Solids	291	mg/L	10.0	12/26/17 15:39	
EPA 300.0	Chloride	10.6	mg/L	1.2	12/22/17 13:09	
EPA 300.0	Nitrate as N	4.0	mg/L	0.10	12/22/17 13:09	
EPA 300.0	Sulfate	33.3	mg/L	1.2	12/22/17 13:09	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	4.4	mg/L	0.10	12/23/17 15:11	
SM 5310C	Total Organic Carbon	1.7J	mg/L	4.0	01/05/18 16:04	
<b>10415459004</b>	<b>MW16d-GW-122017</b>					
RSK 175	Methane	3.8J	ug/L	10.0	12/26/17 13:15	
6010C Met	Barium, Dissolved	54.3	ug/L	10.0	01/08/18 07:09	
6010C Met	Calcium, Dissolved	57000	ug/L	500	01/08/18 07:09	
6010C Met	Magnesium, Dissolved	17100	ug/L	500	01/08/18 07:09	
6010C Met	Manganese, Dissolved	0.49J	ug/L	5.0	01/08/18 07:09	
6010C Met	Potassium, Dissolved	1340J	ug/L	2500	01/08/18 07:09	
6010C Met	Sodium, Dissolved	17300	ug/L	1000	01/08/18 07:09	
6010C Met	Vanadium, Dissolved	9.4J	ug/L	15.0	01/08/18 07:09	
6010C Met	Zinc, Dissolved	3.8J	ug/L	20.0	01/08/18 07:09	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	210	mg/L	5.0	12/28/17 13:58	
SM 2540C	Total Dissolved Solids	316	mg/L	10.0	12/26/17 15:39	
EPA 300.0	Chloride	6.2	mg/L	1.2	12/22/17 14:10	
EPA 300.0	Nitrate as N	5.7	mg/L	0.10	12/22/17 14:10	
EPA 300.0	Sulfate	19.4	mg/L	1.2	12/22/17 14:10	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	6.0	mg/L	0.10	12/23/17 15:12	
SM 5310C	Total Organic Carbon	1.2J	mg/L	4.0	01/05/18 16:19	

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515839

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415155008,10415459002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2804171)
  - Alkalinity, Total as CaCO<sub>3</sub>
- MSD (Lab ID: 2804172)
  - Alkalinity, Total as CaCO<sub>3</sub>

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 97726

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415136001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 420841)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

### General Information:

4 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

H1: Analysis conducted outside the recognized method holding time.

- MW15d-GW-122017 (Lab ID: 10415459002)

H3: Sample was received or analysis requested beyond the recognized method holding time.

- MW6d-GW-122017 (Lab ID: 10415459001)

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515243

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10415446001,12102838004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2801652)
  - Chloride
  - Nitrate as N
  - Sulfate
- MS (Lab ID: 2801666)
  - Chloride
- MSD (Lab ID: 2801653)
  - Nitrate as N
  - Sulfate
- MSD (Lab ID: 2801667)
  - Chloride

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515348

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10414755003,10415446001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2802272)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802273)
  - Nitrogen, NO2 plus NO3

**Additional Comments:**

Analyte Comments:

QC Batch: 515348

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2802270)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2802271)
  - Nitrogen, NO2 plus NO3

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 09, 2018

**General Information:**

4 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

**Sample:** MW6d-GW-122017      **Lab ID:** 10415459001      Collected: 12/20/17 10:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/26/17 12:24	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/26/17 12:24	74-85-1	
Methane	4.4J	ug/L	10.0	1.1	1		12/26/17 12:24	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 06:57	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 06:57	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 06:57	7440-38-2	
Barium, Dissolved	15.0	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 06:57	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 06:57	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 06:57	7440-43-9	
Calcium, Dissolved	32100	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 06:57	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 06:57	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 06:57	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 06:57	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 06:57	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 06:57	7439-92-1	
Magnesium, Dissolved	14500	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 06:57	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 06:57	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 06:57	7440-02-0	
Potassium, Dissolved	6970	ug/L	2500	126	1	01/03/18 10:27	01/08/18 06:57	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 06:57	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 06:57	7440-22-4	
Sodium, Dissolved	18200	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 06:57	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 06:57	7440-28-0	
Vanadium, Dissolved	13.0J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 06:57	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 06:57	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:44	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	178	mg/L	5.0	1.4	1		12/28/17 13:18		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	229	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/26/17 13:46	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.4	mg/L	1.2	0.14	1		12/22/17 14:25	16887-00-6	
Nitrate as N	0.53	mg/L	0.10	0.0079	1		12/22/17 14:25	14797-55-8	H3
Sulfate	5.5	mg/L	1.2	0.27	1		12/22/17 14:25	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Sample: MW6d-GW-122017**      **Lab ID: 10415459001**      Collected: 12/20/17 10:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.58</b>	mg/L	0.020	0.0075	1		12/23/17 14:03		FS
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:22		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.63J</b>	mg/L	2.0	0.40	2		01/08/18 17:52	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

**Sample: MW15d-GW-122017**      **Lab ID: 10415459002**      Collected: 12/20/17 11:35      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/26/17 13:01	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/26/17 13:01	74-85-1	
Methane	4.3J	ug/L	10.0	1.1	1		12/26/17 13:01	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	150J	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 07:01	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 07:01	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 07:01	7440-38-2	
Barium, Dissolved	13.1	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 07:01	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 07:01	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 07:01	7440-43-9	
Calcium, Dissolved	36600	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 07:01	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 07:01	7440-47-3	
Cobalt, Dissolved	1.2J	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 07:01	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 07:01	7440-50-8	
Iron, Dissolved	211	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 07:01	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 07:01	7439-92-1	
Magnesium, Dissolved	13800	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 07:01	7439-95-4	
Manganese, Dissolved	20.5	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 07:01	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 07:01	7440-02-0	
Potassium, Dissolved	2560	ug/L	2500	126	1	01/03/18 10:27	01/08/18 07:01	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 07:01	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 07:01	7440-22-4	
Sodium, Dissolved	15100	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 07:01	7440-23-5	
Thallium, Dissolved	5.1J	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 07:01	7440-28-0	
Vanadium, Dissolved	10.3J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 07:01	7440-62-2	
Zinc, Dissolved	<1.8	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 07:01	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:51	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	169	mg/L	5.0	1.4	1		12/28/17 13:21		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	229	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	0.0060J	mg/L	0.020	0.0050	1		12/26/17 13:46	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	3.0	mg/L	1.2	0.14	1		12/22/17 14:40	16887-00-6	
Nitrate as N	1.9	mg/L	0.10	0.0079	1		12/22/17 14:40	14797-55-8	H1
Sulfate	6.1	mg/L	1.2	0.27	1		12/22/17 14:40	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Sample: MW15d-GW-122017**      **Lab ID: 10415459002**      Collected: 12/20/17 11:35      Received: 12/22/17 11:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>2.0</b>	mg/L	0.020	0.0075	1		12/23/17 14:04		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:23		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>2.2J</b>	mg/L	4.0	0.80	4		01/05/18 15:50	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

**Sample:** MW9d-GW-122017      **Lab ID:** 10415459003      Collected: 12/20/17 13:25      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/26/17 13:08	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/26/17 13:08	74-85-1	
Methane	4.4J	ug/L	10.0	1.1	1		12/26/17 13:08	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 07:05	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 07:05	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 07:05	7440-38-2	
Barium, Dissolved	27.0	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 07:05	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 07:05	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 07:05	7440-43-9	
Calcium, Dissolved	48600	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 07:05	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 07:05	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 07:05	7440-48-4	
Copper, Dissolved	1.4J	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 07:05	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 07:05	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 07:05	7439-92-1	
Magnesium, Dissolved	13800	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 07:05	7439-95-4	
Manganese, Dissolved	4.0J	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 07:05	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 07:05	7440-02-0	
Potassium, Dissolved	2070J	ug/L	2500	126	1	01/03/18 10:27	01/08/18 07:05	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 07:05	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 07:05	7440-22-4	
Sodium, Dissolved	13800	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 07:05	7440-23-5	
Thallium, Dissolved	6.2J	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 07:05	7440-28-0	
Vanadium, Dissolved	6.5J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 07:05	7440-62-2	
Zinc, Dissolved	2.1J	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 07:05	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:53	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	152	mg/L	5.0	1.4	1		12/28/17 13:54		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	291	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/26/17 13:47	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	10.6	mg/L	1.2	0.14	1		12/22/17 13:09	16887-00-6	
Nitrate as N	4.0	mg/L	0.10	0.0079	1		12/22/17 13:09	14797-55-8	
Sulfate	33.3	mg/L	1.2	0.27	1		12/22/17 13:09	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Sample: MW9d-GW-122017**      **Lab ID: 10415459003**      Collected: 12/20/17 13:25      Received: 12/22/17 11:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>4.4</b>	mg/L	0.10	0.037	5		12/23/17 15:11		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:23		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>1.7J</b>	mg/L	4.0	0.80	4		01/05/18 16:04	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

Sample: **MW16d-GW-122017** Lab ID: **10415459004** Collected: 12/20/17 15:10 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		12/26/17 13:15	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		12/26/17 13:15	74-85-1	
Methane	3.8J	ug/L	10.0	1.1	1		12/26/17 13:15	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/03/18 10:27	01/08/18 07:09	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/03/18 10:27	01/08/18 07:09	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/03/18 10:27	01/08/18 07:09	7440-38-2	
Barium, Dissolved	54.3	ug/L	10.0	0.22	1	01/03/18 10:27	01/08/18 07:09	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/03/18 10:27	01/08/18 07:09	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/03/18 10:27	01/08/18 07:09	7440-43-9	
Calcium, Dissolved	57000	ug/L	500	24.7	1	01/03/18 10:27	01/08/18 07:09	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/03/18 10:27	01/08/18 07:09	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/03/18 10:27	01/08/18 07:09	7440-48-4	
Copper, Dissolved	<0.83	ug/L	10.0	0.83	1	01/03/18 10:27	01/08/18 07:09	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/03/18 10:27	01/08/18 07:09	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/03/18 10:27	01/08/18 07:09	7439-92-1	
Magnesium, Dissolved	17100	ug/L	500	2.6	1	01/03/18 10:27	01/08/18 07:09	7439-95-4	
Manganese, Dissolved	0.49J	ug/L	5.0	0.38	1	01/03/18 10:27	01/08/18 07:09	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/03/18 10:27	01/08/18 07:09	7440-02-0	
Potassium, Dissolved	1340J	ug/L	2500	126	1	01/03/18 10:27	01/08/18 07:09	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/03/18 10:27	01/08/18 07:09	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/03/18 10:27	01/08/18 07:09	7440-22-4	
Sodium, Dissolved	17300	ug/L	1000	44.6	1	01/03/18 10:27	01/08/18 07:09	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	01/03/18 10:27	01/08/18 07:09	7440-28-0	
Vanadium, Dissolved	9.4J	ug/L	15.0	0.42	1	01/03/18 10:27	01/08/18 07:09	7440-62-2	
Zinc, Dissolved	3.8J	ug/L	20.0	1.8	1	01/03/18 10:27	01/08/18 07:09	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/03/18 09:17	01/03/18 18:55	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	210	mg/L	5.0	1.4	1		12/28/17 13:58		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	316	mg/L	10.0	5.0	1		12/26/17 15:39		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		12/26/17 13:48	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	6.2	mg/L	1.2	0.14	1		12/22/17 14:10	16887-00-6	
Nitrate as N	5.7	mg/L	0.10	0.0079	1		12/22/17 14:10	14797-55-8	
Sulfate	19.4	mg/L	1.2	0.27	1		12/22/17 14:10	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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**Sample: MW16d-GW-122017**      **Lab ID: 10415459004**      Collected: 12/20/17 15:10      Received: 12/22/17 11:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>6.0</b>	mg/L	0.10	0.037	5		12/23/17 15:12		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/02/18 10:26	01/02/18 14:23		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>1.2J</b>	mg/L	4.0	0.80	4		01/05/18 16:19	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Project No.: 10415459

QC Batch: 515357

Analysis Method: RSK 175

QC Batch Method: RSK 175

Analysis Description: RSK 175 AIR HEADSPACE

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2802388

Matrix: Water

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	12/26/17 10:21	
Ethene	ug/L	<0.68	10.0	0.68	12/26/17 10:21	
Methane	ug/L	3.8J	10.0	1.1	12/26/17 10:21	

LABORATORY CONTROL SAMPLE & LCSD: 2802389

2802390

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	109	111	96	98	85-115	2	20	
Ethene	ug/L	106	103	104	97	98	85-115	2	20	
Methane	ug/L	60.7	60.2	62.0	99	102	85-115	3	20	

SAMPLE DUPLICATE: 2802392

Parameter	Units	2067578005 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	2.4J		20	
Methane	ug/L	69.4	73.3	6	20	

SAMPLE DUPLICATE: 2802527

Parameter	Units	7579315001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	<4.9		20	
Ethene	ug/L	ND	<0.68		20	
Methane	ug/L	0.0075J mg/L	9.6J		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415459

QC Batch: 516182 Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A Analysis Description: 7470A Mercury Water Dissolved  
Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2805645 Matrix: Water  
Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	01/03/18 18:28	

LABORATORY CONTROL SAMPLE: 2805646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.9	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805647 2805648

Parameter	Units	2805647		2805648		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10415446002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury, Dissolved	ug/L	<0.062	5	5	5.0	5.2	100	103	80-120	3	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 516201 Analysis Method: 6010C Met  
 QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
 Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2805718 Matrix: Water  
 Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	01/08/18 06:13	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	01/08/18 06:13	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	01/08/18 06:13	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	01/08/18 06:13	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	01/08/18 06:13	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	01/08/18 06:13	
Calcium, Dissolved	ug/L	<24.7	500	24.7	01/08/18 06:13	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	01/08/18 06:13	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	01/08/18 06:13	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	01/08/18 06:13	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	01/08/18 06:13	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	01/08/18 06:13	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	01/08/18 06:13	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	01/08/18 06:13	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	01/08/18 06:13	
Potassium, Dissolved	ug/L	<126	2500	126	01/08/18 06:13	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	01/08/18 06:13	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	01/08/18 06:13	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	01/08/18 06:13	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	01/08/18 06:13	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	01/08/18 06:13	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	01/08/18 06:13	

LABORATORY CONTROL SAMPLE: 2805719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19100	96	80-120	
Antimony, Dissolved	ug/L	1000	940	94	80-120	
Arsenic, Dissolved	ug/L	1000	917	92	80-120	
Barium, Dissolved	ug/L	1000	941	94	80-120	
Beryllium, Dissolved	ug/L	1000	937	94	80-120	
Cadmium, Dissolved	ug/L	1000	932	93	80-120	
Calcium, Dissolved	ug/L	20000	18200	91	80-120	
Chromium, Dissolved	ug/L	1000	924	92	80-120	
Cobalt, Dissolved	ug/L	1000	927	93	80-120	
Copper, Dissolved	ug/L	1000	916	92	80-120	
Iron, Dissolved	ug/L	20000	18500	92	80-120	
Lead, Dissolved	ug/L	1000	938	94	80-120	
Magnesium, Dissolved	ug/L	20000	18600	93	80-120	
Manganese, Dissolved	ug/L	1000	937	94	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

LABORATORY CONTROL SAMPLE: 2805719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	926	93	80-120	
Potassium, Dissolved	ug/L	20000	18400	92	80-120	
Selenium, Dissolved	ug/L	1000	980	98	80-120	
Silver, Dissolved	ug/L	500	459	92	80-120	
Sodium, Dissolved	ug/L	20000	18400	92	80-120	
Thallium, Dissolved	ug/L	1000	906	91	80-120	
Vanadium, Dissolved	ug/L	1000	910	91	80-120	
Zinc, Dissolved	ug/L	1000	930	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805720 2805721

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10415446001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	16.2J	20000	20000	19900	20100	99	101	75-125	1	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	969	997	97	100	75-125	3	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	955	969	95	96	75-125	1	20	
Barium, Dissolved	ug/L	59.1	1000	1000	1020	1040	96	98	75-125	2	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	970	983	97	98	75-125	1	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	958	968	96	97	75-125	1	20	
Calcium, Dissolved	ug/L	39500	20000	20000	59000	59600	97	100	75-125	1	20	
Chromium, Dissolved	ug/L	0.51J	1000	1000	944	956	94	95	75-125	1	20	
Cobalt, Dissolved	ug/L	1.4J	1000	1000	942	953	94	95	75-125	1	20	
Copper, Dissolved	ug/L	<0.83	1000	1000	956	969	96	97	75-125	1	20	
Iron, Dissolved	ug/L	421	20000	20000	19300	19600	95	96	75-125	2	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	950	962	95	96	75-125	1	20	
Magnesium, Dissolved	ug/L	17400	20000	20000	37000	37500	98	100	75-125	1	20	
Manganese, Dissolved	ug/L	320	1000	1000	1270	1290	95	97	75-125	1	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	937	948	94	95	75-125	1	20	
Potassium, Dissolved	ug/L	15300	20000	20000	35400	36000	100	103	75-125	2	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1000	1010	100	101	75-125	1	20	
Silver, Dissolved	ug/L	<0.27	500	500	469	475	94	95	75-125	1	20	
Sodium, Dissolved	ug/L	50300	20000	20000	69800	71200	98	105	75-125	2	20	
Thallium, Dissolved	ug/L	8.1J	1000	1000	924	938	92	93	75-125	1	20	
Vanadium, Dissolved	ug/L	1.1J	1000	1000	941	952	94	95	75-125	1	20	
Zinc, Dissolved	ug/L	<1.8	1000	1000	932	942	93	94	75-125	1	20	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 515839 Analysis Method: SM 2320B  
 QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
 Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2804168 Matrix: Water  
 Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	12/28/17 11:40	

LABORATORY CONTROL SAMPLE & LCSD: 2804169 2804170

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	40.8	41.1	102	103	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2804171 2804172

Parameter	Units	10415155008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	<1.4	40	40	3.0J	3.6J	7	9	80-120		30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2804173 2804174

Parameter	Units	10415459002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	169	40	40	210	215	103	114	80-120	2	30	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 515446

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2802642

Matrix: Water

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	12/26/17 15:39	

LABORATORY CONTROL SAMPLE: 2802643

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	966	97	80-120	

SAMPLE DUPLICATE: 2802644

Parameter	Units	10415459001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	229	231	1	10	

SAMPLE DUPLICATE: 2802645

Parameter	Units	10415459002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	229	241	5	10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 97726

Analysis Method: SM 4500-S-2 D

QC Batch Method: SM 4500-S-2 D

Analysis Description: 4500S2D Sulfide, Total

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 420838

Matrix: Water

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	12/26/17 13:43	

LABORATORY CONTROL SAMPLE: 420839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.20	101	90-110	

MATRIX SPIKE SAMPLE: 420841

Parameter	Units	10415136001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.042	21	75-125	M1

SAMPLE DUPLICATE: 420840

Parameter	Units	10415136001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 515243 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2801650 Matrix: Water  
 Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.27J	1.2	0.14	12/22/17 14:55	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	12/22/17 14:55	
Sulfate	mg/L	<0.27	1.2	0.27	12/22/17 14:55	

LABORATORY CONTROL SAMPLE: 2801651

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	
Nitrate as N	mg/L	1	0.96	96	90-110	
Sulfate	mg/L	12.5	12.8	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801652 2801653

Parameter	Units	12102838004 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	10.1	12.5	20.8	21.5	86	91	90-110	3	20	M1	
Nitrate as N	mg/L	5.9	1	5.9	6.3	-1	38	90-110	6	20	M1	
Sulfate	mg/L	36.1	12.5	42.7	45.4	53	74	90-110	6	20	M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2801666 2801667

Parameter	Units	10415446001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Chloride	mg/L	34.4	12.5	42.8	40.6	67	50	90-110	5	20	M1	
Nitrate as N	mg/L	<0.0079	1	0.94	0.94	94	94	90-110	0	20		
Sulfate	mg/L	76.4	62.5	135	136	94	96	90-110	1	20		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415459

QC Batch: 515348 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2802268 Matrix: Water  
Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	12/23/17 14:17	FS

LABORATORY CONTROL SAMPLE: 2802269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	104	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802270 2802271

Parameter	Units	10414755003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.7	1	1	2.7	2.6	98	91	90-110	3	20	E

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2802272 2802273

Parameter	Units	10415446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	0.88	0.87	87	86	90-110	1	20	M1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 516185

Analysis Method: EPA 410.4

QC Batch Method: EPA 410.4

Analysis Description: 410.4 COD

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

METHOD BLANK: 2805657

Matrix: Water

Associated Lab Samples: 10415459001, 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	01/02/18 14:17	

LABORATORY CONTROL SAMPLE: 2805658

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	310	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805659 2805660

Parameter	Units	10415063001		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Chemical Oxygen Demand	mg/L	2860	2500	2500	5200	5290	94	97	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2805661 2805662

Parameter	Units	10415061001		MS		MSD		% Rec		Max		Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Chemical Oxygen Demand	mg/L	509	250	250	761	767	101	103	90-110	1	20	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 134481

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10415459002, 10415459003, 10415459004

METHOD BLANK: 535823

Matrix: Water

Associated Lab Samples: 10415459002, 10415459003, 10415459004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	01/05/18 14:26	

LABORATORY CONTROL SAMPLE: 535824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535825 535826

Parameter	Units	10415459004		535826		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Total Organic Carbon	mg/L	1.2J	100	100	104	103	103	102	103	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 535827 535828

Parameter	Units	10415446002		535828		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Total Organic Carbon	mg/L	0.60J	25	25	26.2	26.4	102	103	103	80-120	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

QC Batch: 134800	Analysis Method: SM 5310C
QC Batch Method: SM 5310C	Analysis Description: 5310C TOC
Associated Lab Samples: 10415459001	

METHOD BLANK: 536911 Matrix: Water  
Associated Lab Samples: 10415459001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	01/08/18 16:29	

LABORATORY CONTROL SAMPLE: 536912

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 536913 536914

Parameter	Units	10415780001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Total Organic Carbon	mg/L	1.1	25	25	25.9	26.2	100	101	80-120	1	20				

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415459

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

FS The sample was filtered in the laboratory prior to analysis.

H1 Analysis conducted outside the recognized method holding time.

H3 Sample was received or analysis requested beyond the recognized method holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415459

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10415459001	MW6d-GW-122017	RSK 175	515357		
10415459002	MW15d-GW-122017	RSK 175	515357		
10415459003	MW9d-GW-122017	RSK 175	515357		
10415459004	MW16d-GW-122017	RSK 175	515357		
10415459001	MW6d-GW-122017	EPA 3010	516201	6010C Met	516458
10415459002	MW15d-GW-122017	EPA 3010	516201	6010C Met	516458
10415459003	MW9d-GW-122017	EPA 3010	516201	6010C Met	516458
10415459004	MW16d-GW-122017	EPA 3010	516201	6010C Met	516458
10415459001	MW6d-GW-122017	EPA 7470A	516182	EPA 7470A	516497
10415459002	MW15d-GW-122017	EPA 7470A	516182	EPA 7470A	516497
10415459003	MW9d-GW-122017	EPA 7470A	516182	EPA 7470A	516497
10415459004	MW16d-GW-122017	EPA 7470A	516182	EPA 7470A	516497
10415459001	MW6d-GW-122017	SM 2320B	515839		
10415459002	MW15d-GW-122017	SM 2320B	515839		
10415459003	MW9d-GW-122017	SM 2320B	515839		
10415459004	MW16d-GW-122017	SM 2320B	515839		
10415459001	MW6d-GW-122017	SM 2540C	515446		
10415459002	MW15d-GW-122017	SM 2540C	515446		
10415459003	MW9d-GW-122017	SM 2540C	515446		
10415459004	MW16d-GW-122017	SM 2540C	515446		
10415459001	MW6d-GW-122017	SM 4500-S-2 D	97726		
10415459002	MW15d-GW-122017	SM 4500-S-2 D	97726		
10415459003	MW9d-GW-122017	SM 4500-S-2 D	97726		
10415459004	MW16d-GW-122017	SM 4500-S-2 D	97726		
10415459001	MW6d-GW-122017	EPA 300.0	515243		
10415459002	MW15d-GW-122017	EPA 300.0	515243		
10415459003	MW9d-GW-122017	EPA 300.0	515243		
10415459004	MW16d-GW-122017	EPA 300.0	515243		
10415459001	MW6d-GW-122017	EPA 353.2	515348		
10415459002	MW15d-GW-122017	EPA 353.2	515348		
10415459003	MW9d-GW-122017	EPA 353.2	515348		
10415459004	MW16d-GW-122017	EPA 353.2	515348		
10415459001	MW6d-GW-122017	EPA 410.4	516185	EPA 410.4	516242
10415459002	MW15d-GW-122017	EPA 410.4	516185	EPA 410.4	516242
10415459003	MW9d-GW-122017	EPA 410.4	516185	EPA 410.4	516242
10415459004	MW16d-GW-122017	EPA 410.4	516185	EPA 410.4	516242
10415459001	MW6d-GW-122017	SM 5310C	134800		
10415459002	MW15d-GW-122017	SM 5310C	134481		
10415459003	MW9d-GW-122017	SM 5310C	134481		
10415459004	MW16d-GW-122017	SM 5310C	134481		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10415459

Page: 2 of 2

### Section A

#### Required Client Information:

Company: CH2M Hill  
 Address: 999 W. Riverside Ave. Suite 500  
 Spokane, WA 99201  
 Email:  
 Phone: Fax:  
 Requested Due Date: **10 Day Standard**

### Section B

#### Required Project Information:

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # PEDD# 1497-39-Rev1  
 Project Name: Freeman WA-Grain Handling Facility  
 Project #: 1497

### Section C

#### Invoice Information:

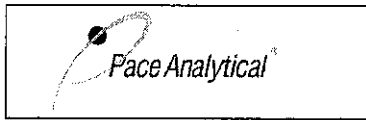
Attention: Anne Walsh  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: **36447**

Regulatory/Agency
State / Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						V/N Analytes Test	Requested Analysis: Filtered (Y/N)																	
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Low Level VOCs by 8280	60107/470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 5310	Sulfide 4500	Methane, Ethane, Ethene RSK175	COD 410.4	Nitrate+Nitrite 353.2								
				DATE	TIME	DATE	TIME																											
1	MW6d-Gw-122017	WT6	G	12/20	1000	-	-	-	8	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	001	Only 2 methane VAs
2	MW5d-Gw-122017	WT6	G	12/20	1135	-	-	-	8	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	002	
3	MW9d-Gw-122017	WT6	G	12/20	1325	-	-	-	8	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	003	
4	MW6d-Gw-122017	WT6	G	12/20	1510	-	-	-	8	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	004	
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Short hold analyses are in bold	John Li / CH2M	12/20/17	1700	Mark Pdece	12/22/17	1130	2.2	Y	Y	Y	Y
*Field filtered by client											

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Jonathan Espinoza	SIGNATURE of SAMPLER: John Li				
DATE Signed: 12/20/17					



Document Name:  
**Sample Condition Upon Receipt Form - ESI**  
 Document No.:  
**F-MN-L-210-rev.24**

Document Revised: 18Dec2017  
 Page 1 of 2  
 Issuing Authority:  
 Pace Minnesota Quality Office

Sample Condition  
 Upon Receipt - ESI  
 Tech Specs

Client Name:  
UPRR

Project #:

**WO# : 10415459**

10415459

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
 Tracking Number: 7475 9636 4419

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB      Temp Blank?  Yes  No  
 Thermometer Used:  151401163  G87A9155100842      Type of Ice:  Wet  Blue  None  Dry  Melted  
 Cooler Temp Read (°C): 2.5      Cooler Temp Corrected (°C): 2.2      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: -0.3      Date and Initials of Person Examining Contents: MD 12/22/17

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <u>NO MS/MSD</u>
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH <input type="checkbox"/> Positive for Res. Chlorine? Y N <u>MD 12/22/17</u> Sample # <u>4-4</u> <u>1-4 = 1/1 1/1 1/1</u>
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform (TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin) Per method, VOA pH is checked after analysis	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Field Data Required?  Yes  No

**Comments/Resolution:**

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins	
Opened Time: <u>1225</u> Temp: <u>2.5</u>	Corrected Temp: <u>2.2</u>
Time: <u>1245</u> put in cooler	
Time: _____ Temp: _____	Corrected Temp: _____

**Project Manager Review:**

Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers)

JENNI GROSS

Date: 12/22/17  
 will be sent to the North Carolina DEHNR Certification Office (i.e. out of

# Chain of Custody

## WO#: 12102994

PM: HRZ

Due Date: 01/09/18

CLIENT: Pace WA

Workorder: 10415459

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date:

12/22/2017

Results Requested By:

1/9/2018

Report To			Subcontract To				Requested Analysis																																	
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426			Pace Analytical Virginia MN 315 Chestnut Street Virginia, MN 55792 Phone (218)742-1042																																					
							5632351 / 5310 TOC																																	
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers										LAB USE ONLY																								
						H2SO4																																		
1	MW6d-GW-122017	PS	12/20/2017 10:00	10415459001	Water	1																																		
2	MW15d-GW-122017	PS	12/20/2017 11:35	10415459002	Water	1																																		
3	MW9d-GW-122017	PS	12/20/2017 13:25	10415459003	Water	1																																		
4	MW16d-GW-122017	PS	12/20/2017 15:10	10415459004	Water	1																																		
5																																								
Comments																																								
Transfers	Released By	Date/Time	Received By	Date/Time																																				
1	<i>[Signature]</i>	12/22/17 16:15	<i>[Signature]</i>																																					
2	<i>[Signature]</i>	12-22 23:00	<i>[Signature]</i>	12/26/17 05:00																																				
3																																								
Cooler Temperature on Receipt		3.4 °C		Custody Seal		Y or N		Received on Ice		Y or N		Samples Intact															Y or N													

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.

**Sample Condition Upon Receipt**

Client Name: Pace MN

Project #:

**WO# : 12102994**  
 PM: HRZ Due Date: 01/09/18  
 CLIENT: Pace WA

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 3.1 Cooler Temp Corrected °C: 3.4 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 0.3 Date and Initials of Person Examining Contents: 12-23-17 DC

Comments: M-12/26/17

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: [Signature] Date: 12/26/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



# Chain of Custody

# WO#: 2067687



Workorder: 10415459      Workorder Name: 1497 Freeman WA-Grain Handling      Owner Received Date: 12/22/2017      Results Requested By: 1/9/2018

Report To		Subcontract To					Requested Analysis																					
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					<div style="display: flex; justify-content: space-between;"> <span>5636267 / 4500 Sulfide</span> <span>LAB USE ONLY</span> </div>																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other																						
1	MW6d-GW-122017	PS	12/20/2017 10:00	10415459001	Water	1																						
2	MW15d-GW-122017	PS	12/20/2017 11:35	10415459002	Water	1																						
3	MW9d-GW-122017	PS	12/20/2017 13:25	10415459003	Water	1																						
4	MW16d-GW-122017	PS	12/20/2017 15:10	10415459004	Water	1																						
Transfers		Released By	Date/Time	Received By	Date/Time	Comments																						
1		<i>[Signature]</i>	12/22/17 12:10	<i>[Signature]</i>																								
2		FedEx	12/23/17 9:45	<i>[Signature]</i>	12/23/17 9:45																							
3																												
Cooler Temperature on Receipt		4.0 °C	Custody Seal	Y or N	Received on Ice	Y or N	Samples Intact Y or N																					

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

WO#: 2067687



Sample Condition Upon F

PM: CMM

Due Date: 01/09/18

1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

CLIENT: PASI-MINN

Proj

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12-23-17 MB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

December 29, 2017

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

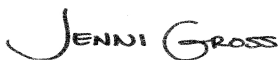
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10415465

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10415465001	MW6d-GW-122017	Water	12/20/17 10:00	12/22/17 11:30
10415465002	MW15d-GW-122017	Water	12/20/17 11:35	12/22/17 11:30
10415465003	MW9d-GW-122017	Water	12/20/17 13:25	12/22/17 11:30
10415465004	MW16d-GW-122017	Water	12/20/17 15:10	12/22/17 11:30
10415465005	Trip Blank	Water	12/20/17 00:00	12/22/17 11:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415465001	MW6d-GW-122017	EPA 8260B	DJB	83	PASI-M
10415465002	MW15d-GW-122017	EPA 8260B	DJB	83	PASI-M
10415465003	MW9d-GW-122017	EPA 8260B	DJB	83	PASI-M
10415465004	MW16d-GW-122017	EPA 8260B	DJB	83	PASI-M
10415465005	Trip Blank	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415465001</b>	<b>MW6d-GW-122017</b>					
EPA 8260B	Carbon tetrachloride	2.2	ug/L	0.50	12/26/17 17:34	
<b>10415465002</b>	<b>MW15d-GW-122017</b>					
EPA 8260B	Carbon tetrachloride	9.7	ug/L	0.50	12/26/17 17:57	
<b>10415465003</b>	<b>MW9d-GW-122017</b>					
EPA 8260B	Carbon disulfide	0.58J	ug/L	1.0	12/26/17 18:20	
EPA 8260B	Carbon tetrachloride	95.7	ug/L	0.50	12/26/17 18:20	
EPA 8260B	Chloroform	3.3	ug/L	1.0	12/26/17 18:20	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** December 29, 2017

### General Information:

5 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- MW15d-GW-122017 (Lab ID: 10415465002)
- MW16d-GW-122017 (Lab ID: 10415465004)
- MW6d-GW-122017 (Lab ID: 10415465001)
- MW9d-GW-122017 (Lab ID: 10415465003)
- Trip Blank (Lab ID: 10415465005)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 515429

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10415465

Sample: **MW6d-GW-122017** Lab ID: **10415465001** Collected: 12/20/17 10:00 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 17:34	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 17:34	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 17:34	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 17:34	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:34	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:34	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 17:34	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 17:34	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:34	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 17:34	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 17:34	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 17:34	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 17:34	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 17:34	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 17:34	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 17:34	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:34	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 17:34	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 17:34	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 17:34	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 17:34	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 17:34	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 17:34	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 17:34	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 17:34	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 17:34	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 17:34	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 17:34	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 17:34	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 17:34	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 17:34	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 17:34	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 17:34	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 17:34	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 17:34	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 17:34	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 17:34	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/26/17 17:34	75-15-0	
Carbon tetrachloride	2.2	ug/L	0.50	0.20	1		12/26/17 17:34	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 17:34	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 17:34	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 17:34	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 17:34	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: MW6d-GW-122017**      **Lab ID: 10415465001**      Collected: 12/20/17 10:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>									
Analytical Method: EPA 8260B									
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 17:34	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 17:34	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 17:34	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 17:34	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 17:34	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 17:34	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 17:34	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 17:34	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 17:34	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 17:34	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 17:34	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 17:34	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 17:34	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 17:34	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 17:34	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 17:34	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 17:34	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 17:34	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 17:34	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 17:34	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 17:34	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 17:34	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 17:34	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 17:34	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 17:34	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 17:34	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 17:34	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 17:34	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 17:34	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 17:34	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 17:34	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		12/26/17 17:34	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		12/26/17 17:34	2037-26-5	
4-Bromofluorobenzene (S)	101	%	75-125		1		12/26/17 17:34	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: MW15d-GW-122017**      **Lab ID: 10415465002**      Collected: 12/20/17 11:35      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 17:57	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 17:57	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 17:57	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 17:57	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:57	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:57	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 17:57	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 17:57	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:57	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 17:57	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 17:57	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 17:57	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 17:57	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 17:57	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 17:57	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 17:57	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 17:57	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 17:57	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 17:57	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 17:57	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 17:57	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 17:57	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 17:57	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 17:57	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 17:57	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 17:57	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 17:57	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 17:57	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 17:57	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 17:57	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 17:57	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 17:57	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 17:57	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 17:57	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 17:57	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 17:57	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 17:57	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/26/17 17:57	75-15-0	
Carbon tetrachloride	9.7	ug/L	0.50	0.20	1		12/26/17 17:57	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 17:57	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 17:57	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 17:57	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 17:57	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: MW15d-GW-122017**      **Lab ID: 10415465002**      Collected: 12/20/17 11:35      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 17:57	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 17:57	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 17:57	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 17:57	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 17:57	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 17:57	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 17:57	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 17:57	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 17:57	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 17:57	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 17:57	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 17:57	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 17:57	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 17:57	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 17:57	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 17:57	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 17:57	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 17:57	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 17:57	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 17:57	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 17:57	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 17:57	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 17:57	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 17:57	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 17:57	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 17:57	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 17:57	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 17:57	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 17:57	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 17:57	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 17:57	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	105	%	75-137		1		12/26/17 17:57	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1		12/26/17 17:57	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		12/26/17 17:57	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

Sample: **MW9d-GW-122017** Lab ID: **10415465003** Collected: 12/20/17 13:25 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 18:20	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 18:20	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 18:20	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 18:20	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:20	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:20	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 18:20	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 18:20	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:20	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 18:20	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 18:20	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 18:20	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 18:20	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 18:20	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 18:20	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 18:20	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:20	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 18:20	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 18:20	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 18:20	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 18:20	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 18:20	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 18:20	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 18:20	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 18:20	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 18:20	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 18:20	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 18:20	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 18:20	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 18:20	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 18:20	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 18:20	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 18:20	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 18:20	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 18:20	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 18:20	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 18:20	74-83-9	
Carbon disulfide	0.58J	ug/L	1.0	0.37	1		12/26/17 18:20	75-15-0	
Carbon tetrachloride	95.7	ug/L	0.50	0.20	1		12/26/17 18:20	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 18:20	75-00-3	
Chloroform	3.3	ug/L	1.0	0.46	1		12/26/17 18:20	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 18:20	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 18:20	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: MW9d-GW-122017**      **Lab ID: 10415465003**      Collected: 12/20/17 13:25      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b> Analytical Method: EPA 8260B									
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 18:20	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 18:20	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 18:20	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 18:20	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 18:20	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 18:20	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 18:20	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 18:20	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 18:20	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 18:20	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 18:20	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 18:20	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 18:20	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 18:20	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 18:20	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 18:20	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 18:20	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 18:20	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 18:20	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 18:20	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 18:20	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 18:20	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 18:20	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 18:20	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 18:20	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 18:20	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 18:20	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 18:20	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 18:20	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 18:20	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 18:20	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		12/26/17 18:20	17060-07-0	
Toluene-d8 (S)	103	%	75-125		1		12/26/17 18:20	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		12/26/17 18:20	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10415465

Sample: **MW16d-GW-122017** Lab ID: **10415465004** Collected: 12/20/17 15:10 Received: 12/22/17 11:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 18:44	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 18:44	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 18:44	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 18:44	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:44	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:44	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 18:44	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 18:44	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:44	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 18:44	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 18:44	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 18:44	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 18:44	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 18:44	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 18:44	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 18:44	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 18:44	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 18:44	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 18:44	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 18:44	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 18:44	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 18:44	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 18:44	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 18:44	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 18:44	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 18:44	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 18:44	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 18:44	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 18:44	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 18:44	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 18:44	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 18:44	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 18:44	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 18:44	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 18:44	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 18:44	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 18:44	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/26/17 18:44	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/26/17 18:44	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 18:44	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 18:44	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 18:44	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 18:44	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: MW16d-GW-122017**      **Lab ID: 10415465004**      Collected: 12/20/17 15:10      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>									
Analytical Method: EPA 8260B									
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 18:44	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 18:44	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 18:44	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 18:44	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 18:44	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 18:44	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 18:44	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 18:44	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 18:44	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 18:44	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 18:44	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 18:44	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 18:44	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 18:44	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 18:44	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 18:44	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 18:44	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 18:44	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 18:44	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 18:44	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 18:44	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 18:44	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 18:44	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 18:44	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 18:44	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 18:44	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 18:44	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 18:44	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 18:44	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 18:44	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 18:44	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	108	%	75-137		1		12/26/17 18:44	17060-07-0	
Toluene-d8 (S)	105	%	75-125		1		12/26/17 18:44	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		12/26/17 18:44	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: Trip Blank**      **Lab ID: 10415465005**      Collected: 12/20/17 00:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 16:00	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		12/26/17 16:00	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		12/26/17 16:00	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		12/26/17 16:00	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:00	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:00	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	1.0	0.14	1		12/26/17 16:00	87-61-6	L2
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		12/26/17 16:00	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:00	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	1.0	0.098	1		12/26/17 16:00	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		12/26/17 16:00	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		12/26/17 16:00	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		12/26/17 16:00	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		12/26/17 16:00	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		12/26/17 16:00	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		12/26/17 16:00	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		12/26/17 16:00	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 16:00	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		12/26/17 16:00	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		12/26/17 16:00	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		12/26/17 16:00	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		12/26/17 16:00	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		12/26/17 16:00	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		12/26/17 16:00	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		12/26/17 16:00	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		12/26/17 16:00	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		12/26/17 16:00	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		12/26/17 16:00	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		12/26/17 16:00	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		12/26/17 16:00	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		12/26/17 16:00	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		12/26/17 16:00	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		12/26/17 16:00	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 16:00	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		12/26/17 16:00	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		12/26/17 16:00	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		12/26/17 16:00	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		12/26/17 16:00	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		12/26/17 16:00	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		12/26/17 16:00	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		12/26/17 16:00	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		12/26/17 16:00	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 16:00	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

**Sample: Trip Blank**      **Lab ID: 10415465005**      Collected: 12/20/17 00:00      Received: 12/22/17 11:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		12/26/17 16:00	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		12/26/17 16:00	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		12/26/17 16:00	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		12/26/17 16:00	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		12/26/17 16:00	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		12/26/17 16:00	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		12/26/17 16:00	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		12/26/17 16:00	91-20-3	L2
Styrene	<0.14	ug/L	1.0	0.14	1		12/26/17 16:00	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		12/26/17 16:00	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		12/26/17 16:00	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		12/26/17 16:00	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		12/26/17 16:00	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		12/26/17 16:00	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		12/26/17 16:00	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		12/26/17 16:00	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		12/26/17 16:00	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		12/26/17 16:00	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	1.0	0.12	1		12/26/17 16:00	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		12/26/17 16:00	179601-23-1	
n-Butylbenzene	<0.13	ug/L	1.0	0.13	1		12/26/17 16:00	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 16:00	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		12/26/17 16:00	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		12/26/17 16:00	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		12/26/17 16:00	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		12/26/17 16:00	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		12/26/17 16:00	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		12/26/17 16:00	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		12/26/17 16:00	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	1.0	0.14	1		12/26/17 16:00	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		12/26/17 16:00	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	107	%	75-137		1		12/26/17 16:00	17060-07-0	
Toluene-d8 (S)	104	%	75-125		1		12/26/17 16:00	2037-26-5	
4-Bromofluorobenzene (S)	104	%	75-125		1		12/26/17 16:00	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

QC Batch: 515429 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10415465001, 10415465002, 10415465003, 10415465004, 10415465005

METHOD BLANK: 2802588 Matrix: Water  
Associated Lab Samples: 10415465001, 10415465002, 10415465003, 10415465004, 10415465005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	12/26/17 15:36	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	12/26/17 15:36	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	12/26/17 15:36	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	12/26/17 15:36	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,2,3-Trichlorobenzene	ug/L	<0.14	1.0	0.14	12/26/17 15:36	MN
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	12/26/17 15:36	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,2,4-Trimethylbenzene	ug/L	<0.098	1.0	0.098	12/26/17 15:36	MN
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	12/26/17 15:36	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	12/26/17 15:36	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	12/26/17 15:36	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	12/26/17 15:36	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	12/26/17 15:36	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	12/26/17 15:36	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	12/26/17 15:36	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	12/26/17 15:36	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	12/26/17 15:36	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	12/26/17 15:36	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	12/26/17 15:36	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	12/26/17 15:36	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	12/26/17 15:36	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	12/26/17 15:36	
2-Hexanone	ug/L	<2.5	5.0	2.5	12/26/17 15:36	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	12/26/17 15:36	
Acetone	ug/L	<8.8	20.0	8.8	12/26/17 15:36	
Acrolein	ug/L	<4.8	10.0	4.8	12/26/17 15:36	
Acrylonitrile	ug/L	<4.9	10.0	4.9	12/26/17 15:36	
Benzene	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Bromobenzene	ug/L	<0.16	0.50	0.16	12/26/17 15:36	
Bromochloromethane	ug/L	<0.38	1.0	0.38	12/26/17 15:36	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	12/26/17 15:36	
Bromoform	ug/L	<1.0	4.0	1.0	12/26/17 15:36	
Bromomethane	ug/L	<1.5	4.0	1.5	12/26/17 15:36	
Carbon disulfide	ug/L	<0.37	1.0	0.37	12/26/17 15:36	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	12/26/17 15:36	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

METHOD BLANK: 2802588

Matrix: Water

Associated Lab Samples: 10415465001, 10415465002, 10415465003, 10415465004, 10415465005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
Chloroethane	ug/L	<0.44	1.0	0.44	12/26/17 15:36	
Chloroform	ug/L	<0.46	1.0	0.46	12/26/17 15:36	
Chloromethane	ug/L	<1.1	4.0	1.1	12/26/17 15:36	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	12/26/17 15:36	
cis-1,3-Dichloropropene	ug/L	<0.12	1.0	0.12	12/26/17 15:36	MN
Dibromochloromethane	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Dibromomethane	ug/L	<0.50	1.0	0.50	12/26/17 15:36	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	12/26/17 15:36	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	12/26/17 15:36	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	12/26/17 15:36	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Ethylbenzene	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	12/26/17 15:36	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
m&p-Xylene	ug/L	<0.24	1.0	0.24	12/26/17 15:36	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
Methylene Chloride	ug/L	<1.2	4.0	1.2	12/26/17 15:36	
n-Butylbenzene	ug/L	<0.13	1.0	0.13	12/26/17 15:36	MN
n-Propylbenzene	ug/L	<0.12	0.50	0.12	12/26/17 15:36	
Naphthalene	ug/L	<0.42	1.0	0.42	12/26/17 15:36	
o-Xylene	ug/L	<0.11	0.50	0.11	12/26/17 15:36	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	12/26/17 15:36	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	12/26/17 15:36	
Styrene	ug/L	<0.14	1.0	0.14	12/26/17 15:36	MN
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	12/26/17 15:36	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	12/26/17 15:36	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	12/26/17 15:36	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	12/26/17 15:36	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	12/26/17 15:36	
Toluene	ug/L	<0.17	0.50	0.17	12/26/17 15:36	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	12/26/17 15:36	
trans-1,3-Dichloropropene	ug/L	<0.14	1.0	0.14	12/26/17 15:36	MN
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	12/26/17 15:36	
Trichloroethene	ug/L	<0.18	0.40	0.18	12/26/17 15:36	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	12/26/17 15:36	
Vinyl acetate	ug/L	<1.5	10.0	1.5	12/26/17 15:36	
Vinyl chloride	ug/L	<0.096	0.20	0.096	12/26/17 15:36	
Xylene (Total)	ug/L	<0.24	1.5	0.24	12/26/17 15:36	
1,2-Dichloroethane-d4 (S)	%	104	75-137		12/26/17 15:36	
4-Bromofluorobenzene (S)	%	106	75-125		12/26/17 15:36	
Toluene-d8 (S)	%	102	75-125		12/26/17 15:36	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

LABORATORY CONTROL SAMPLE & LCSD: 2802589		2802590									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
1,1,1,2-Tetrachloroethane	ug/L	20	16.8	16.9	84	84	75-136	1	30		
1,1,1-Trichloroethane	ug/L	20	17.5	16.9	87	85	75-129	3	30		
1,1,2,2-Tetrachloroethane	ug/L	20	15.6	16.0	78	80	71-138	3	30		
1,1,2-Trichloroethane	ug/L	20	17.7	18.0	89	90	75-125	2	30		
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.4	16.8	87	84	69-126	4	30		
1,1-Dichloroethane	ug/L	20	18.4	17.8	92	89	75-125	3	30		
1,1-Dichloroethene	ug/L	20	17.4	17.0	87	85	75-125	2	30		
1,1-Dichloropropene	ug/L	20	18.5	17.8	92	89	75-125	4	30		
1,2,3-Trichlorobenzene	ug/L	20	14.3	16.1	71	81	75-125	12	30	L2	
1,2,3-Trichloropropane	ug/L	20	16.4	16.8	82	84	75-125	2	30		
1,2,4-Trichlorobenzene	ug/L	20	16.0	16.8	80	84	75-125	5	30		
1,2,4-Trimethylbenzene	ug/L	20	15.8	15.6	79	78	75-125	1	30		
1,2-Dibromo-3-chloropropane	ug/L	50	36.0	39.8	72	80	71-130	10	30		
1,2-Dibromoethane (EDB)	ug/L	20	17.6	18.3	88	91	75-125	4	30		
1,2-Dichlorobenzene	ug/L	20	16.4	16.6	82	83	75-125	1	30		
1,2-Dichloroethane	ug/L	20	18.5	17.7	92	89	70-125	4	30		
1,2-Dichloroethene (Total)	ug/L	40	35.9	34.4	90	86	75-125	4	30		
1,2-Dichloropropane	ug/L	20	17.7	17.9	88	90	75-125	2	30		
1,3,5-Trimethylbenzene	ug/L	20	16.8	17.0	84	85	75-125	1	30		
1,3-Dichlorobenzene	ug/L	20	16.1	16.2	81	81	75-125	1	30		
1,3-Dichloropropane	ug/L	20	17.9	17.5	89	87	75-125	2	30		
1,4-Dichlorobenzene	ug/L	20	16.3	16.5	81	83	75-125	1	30		
1,4-Dioxane (p-Dioxane)	ug/L	400	326	282	82	71	64-140	14	30		
2,2,4-Trimethylpentane	ug/L	20	18.6	18.4	93	92	68-125	1	30		
2,2-Dichloropropane	ug/L	20	18.8	18.4	94	92	70-131	2	30		
2-Butanone (MEK)	ug/L	100	81.3	81.4	81	81	69-125	0	30		
2-Chlorotoluene	ug/L	20	16.4	16.2	82	81	75-125	2	30		
2-Hexanone	ug/L	100	73.5	75.6	73	76	73-129	3	30		
4-Chlorotoluene	ug/L	20	17.3	17.6	86	88	75-125	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	100	83.8	85.7	84	86	73-125	2	30		
Acetone	ug/L	100	85.8	89.5	86	89	66-126	4	30		
Acrolein	ug/L	200	172	170	86	85	56-150	1	30		
Acrylonitrile	ug/L	200	173	170	86	85	68-129	2	30		
Benzene	ug/L	20	18.3	17.6	91	88	75-125	4	30		
Bromobenzene	ug/L	20	16.9	16.9	84	85	75-125	0	30		
Bromochloromethane	ug/L	20	17.9	17.8	90	89	75-126	0	30		
Bromodichloromethane	ug/L	20	17.9	18.3	90	92	75-133	2	30		
Bromoform	ug/L	20	15.4	15.9	77	79	62-142	3	30		
Bromomethane	ug/L	20	19.1	19.1	95	95	34-143	0	30		
Carbon disulfide	ug/L	20	17.1	16.4	85	82	71-125	4	30		
Carbon tetrachloride	ug/L	20	18.0	17.1	90	86	71-145	5	30		
Chlorobenzene	ug/L	20	17.2	17.4	86	87	75-125	2	30		
Chloroethane	ug/L	20	17.9	18.0	90	90	75-125	0	30		
Chloroform	ug/L	20	18.0	17.1	90	86	75-125	5	30		
Chloromethane	ug/L	20	19.8	19.0	99	95	54-125	4	30		
cis-1,2-Dichloroethene	ug/L	20	18.0	17.7	90	89	75-125	1	30		
cis-1,3-Dichloropropene	ug/L	20	17.2	16.8	86	84	75-125	2	30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

LABORATORY CONTROL SAMPLE & LCSD: 2802589		2802590									
Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers	
Dibromochloromethane	ug/L	20	17.7	17.7	88	89	74-141	0	30		
Dibromomethane	ug/L	20	15.9	16.7	80	83	75-125	5	30		
Dichlorodifluoromethane	ug/L	20	17.4	16.6	87	83	59-130	5	30		
Dichlorofluoromethane	ug/L	20	18.7	17.6	93	88	75-125	6	30		
Diisopropyl ether	ug/L	20	18.6	18.4	93	92	69-125	1	30		
Ethyl-tert-butyl ether	ug/L	20	18.6	18.5	93	92	73-125	1	30		
Ethylbenzene	ug/L	20	17.7	17.4	88	87	75-125	2	30		
Hexachloro-1,3-butadiene	ug/L	20	16.9	17.2	85	86	75-131	2	30		
Isopropylbenzene (Cumene)	ug/L	20	17.6	17.6	88	88	75-125	0	30		
m&p-Xylene	ug/L	40	35.6	35.7	89	89	75-125	0	30		
Methyl-tert-butyl ether	ug/L	20	18.0	18.0	90	90	75-125	0	30		
Methylene Chloride	ug/L	20	17.9	17.4	90	87	73-125	3	30		
n-Butylbenzene	ug/L	20	15.8	15.6	79	78	75-125	1	30		
n-Propylbenzene	ug/L	20	16.8	16.6	84	83	75-125	1	30		
Naphthalene	ug/L	20	13.8	15.4	69	77	74-125	12	30	L2	
o-Xylene	ug/L	20	17.8	17.1	89	86	75-125	4	30		
p-Isopropyltoluene	ug/L	20	17.2	16.5	86	83	75-125	4	30		
sec-Butylbenzene	ug/L	20	17.1	17.1	85	85	75-125	0	30		
Styrene	ug/L	20	16.9	16.8	84	84	75-125	0	30		
tert-Amylmethyl ether	ug/L	20	18.3	17.6	91	88	71-126	4	30		
tert-Butyl Alcohol	ug/L	200	156	177	78	89	69-131	13	30		
tert-Butylbenzene	ug/L	20	17.1	16.6	86	83	75-125	3	30		
Tetrachloroethene	ug/L	20	17.1	16.7	86	83	75-125	3	30		
Tetrahydrofuran	ug/L	200	178	189	89	95	65-127	6	30		
Toluene	ug/L	20	17.5	17.8	88	89	75-125	1	30		
trans-1,2-Dichloroethene	ug/L	20	17.9	16.7	90	84	75-125	7	30		
trans-1,3-Dichloropropene	ug/L	20	17.5	17.7	87	88	75-125	1	30		
trans-1,4-Dichloro-2-butene	ug/L	50	41.8	43.1	84	86	30-150	3	30		
Trichloroethene	ug/L	20	16.6	16.6	83	83	75-125	1	30		
Trichlorofluoromethane	ug/L	20	17.6	17.0	88	85	71-140	3	30		
Vinyl acetate	ug/L	20	19.1	19.0	95	95	68-137	0	30		
Vinyl chloride	ug/L	20	19.2	18.5	96	92	70-125	4	30		
Xylene (Total)	ug/L	60	53.4	52.9	89	88	75-125	1	30		
1,2-Dichloroethane-d4 (S)	%				106	104	75-137				
4-Bromofluorobenzene (S)	%				99	100	75-125				
Toluene-d8 (S)	%				107	106	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### BATCH QUALIFIERS

Batch: 515429

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

MN The reporting limit has been raised in accordance with Minnesota Statutes 4740.2100 Subpart 8. C, D. Reporting Limit Evaluation Rule.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10415465

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10415465001	MW6d-GW-122017	EPA 8260B	515429		
10415465002	MW15d-GW-122017	EPA 8260B	515429		
10415465003	MW9d-GW-122017	EPA 8260B	515429		
10415465004	MW16d-GW-122017	EPA 8260B	515429		
10415465005	Trip Blank	EPA 8260B	515429		

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10415465

Page: 1 of 1

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:		Regulatory Agency:	
Company: CH2M Hill		Report To: Mark Ochsner, Brad Ostapkowicz		Attention: Anne Walsh			
Address: 999 W. Riverside Ave, Suite 500 Spokane, WA 99201		Copy To: Steve Demus, Lindsey Baumann		Company: UPRR			
Email:		Copy To: David Hodson, UPRR-Sysdat@ghd.com		Address: 1400 W. 52nd Ave, Denver, CO 80221			
Phone:		Purchase Order # PEDD# 1497-39-Rev1		Pace Quote: Contract# 758938			
Requested Due Date: <b>10 Day Standard</b>		Project Name: Freeman WA-Grain Handling Facility		Pace Project Manager: Jennifer Gross		State / Location:	
		Project #: 1497		Pace Profile #: 36447		WA / Freeman	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						ANALYSES TEST	Requested Analysis Filtered (Y/N)		State / Location			
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Y	N				
				DATE	TIME	DATE	TIME															
1	MWgd-GW-122017	WTG	2017	12/20	1000	-	-	-	3			X									CO	1
2	MWISd-GW-122017	WTG	2017	12/20	1135	-	-	-	3			X									CO	2
3	MWgd-GW-122017	WTG	2017	12/20	1325	-	-	-	3			X									CO	3
4	MWgd-GW-122017	WTG	2017	12/20	1510	-	-	-	3			X									CO	4
5	Trip Blank	WTG	2017	12/20	-	-	-	-	2			X									CO	5
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Short hold analyses are in bold	Jonathan Li / CH2M	12/20/17	1700	Mott Pace	12/22/17	1130	2.2	Y	Y	Y
*Field filtered by client										

SAMPLER NAME AND SIGNATURE			TEMP in C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Jonathan Espinoza						
SIGNATURE of SAMPLER: Jonathan Li		DATE Signed: 12/20/17				

<b>Sample Condition Upon Receipt - ESI Tech Specs</b>	Client Name: <b>UPRR</b>	Project #: <b>WO# : 10415465</b>
	Courier: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Commercial <input type="checkbox"/> Pace <input type="checkbox"/> Speedee <input type="checkbox"/> Other: _____ Tracking Number: <b>7475 9636</b>	



Custody Seal on Cooler/Box Present?  Yes  No    Seals Intact?  Yes  No    Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_  
 Packing Material:  Bubble Wrap     Bubble Bags     None     Other: **PB**    Temp Blank?  Yes  No  
 Thermometer  151401163     G87A9155100842    Type of Ice:  Wet     Blue     None     Dry     Melted  
 Cooler Temp Read (°C): **2.5**    Cooler Temp Corrected (°C): **2.2**    Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C    Correction Factor: **-0.3**    Date and Initials of Person Examining Contents: **MD 12/22/17**  
**USDA Regulated Soil** ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No    Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. <b>NO MS/MSD</b>
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <b>UT</b>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: <b>VOA</b> Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Per method, VOA pH is checked after analysis		
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15. <b>two Present</b>
Trip Blank Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <b>141537</b>		

**CLIENT NOTIFICATION/RESOLUTION**    Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <b>1225</b>	Temp: <b>2.5</b>	Corrected Temp: <b>2.2</b>
Time: <b>1245</b>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** \_\_\_\_\_ Date: **12/22/17**  
 Note: Whenever there is a discrepancy affecting North Carolina compliance hold, incorrect preservative, out of temp, incorrect containers) **JENNI GROSS** rm will be sent to the North Carolina DEHNR Certification Office (i.e. out of

January 04, 2018

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 661508.10.02.03 Freeman UPRR  
Pace Project No.: 10415471

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on December 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Ryan Thibault for  
Chris Bremer  
chris.bremer@pacelabs.com  
1(612)607-6390  
Project Manager

Enclosures

cc: Chase Holton, CH2M Engineers  
Julie Lidstone, GHD  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10415471001	SSV-1-121917	Air	12/19/17 12:34	12/22/17 11:30
10415471002	SSV-2-121917	Air	12/19/17 16:56	12/22/17 11:30
10415471003	SSV-3-121917	Air	12/19/17 18:31	12/22/17 11:30
10415471004	Unused Can #2788	Air		12/22/17 11:30
10415471005	Unused Can #1332	Air		12/22/17 11:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10415471001	SSV-1-121917	TO-15	AFV	2	PASI-M
10415471002	SSV-2-121917	TO-15	AFV	2	PASI-M
10415471003	SSV-3-121917	TO-15	AFV	2	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10415471001</b>	<b>SSV-1-121917</b>					
TO-15	Carbon tetrachloride	0.29	ug/m3	0.14	01/03/18 16:56	
TO-15	Chloroform	0.12	ug/m3	0.071	12/29/17 15:12	
<b>10415471002</b>	<b>SSV-2-121917</b>					
TO-15	Carbon tetrachloride	0.23	ug/m3	0.16	01/03/18 17:23	
TO-15	Chloroform	0.12	ug/m3	0.080	12/29/17 15:40	
<b>10415471003</b>	<b>SSV-3-121917</b>					
TO-15	Carbon tetrachloride	1.8	ug/m3	0.11	12/29/17 16:08	
TO-15	Chloroform	1.8	ug/m3	0.085	12/29/17 16:08	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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**Method:** TO-15

**Description:** TO15 MSV AIR SIM SCAN

**Client:** UPRR\_CH2M Hill

**Date:** January 04, 2018

**General Information:**

3 samples were analyzed for TO-15. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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**Sample: SSV-1-121917**      **Lab ID: 10415471001**      Collected: 12/19/17 12:34      Received: 12/22/17 11:30      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<b>0.29</b>	ug/m3	0.14	0.10	4.51		01/03/18 16:56	56-23-5	
Chloroform	<b>0.12</b>	ug/m3	0.071	0.054	2.87		12/29/17 15:12	67-66-3	

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## ANALYTICAL RESULTS

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

---

**Sample: SSV-2-121917**      **Lab ID: 10415471002**      Collected: 12/19/17 16:56      Received: 12/22/17 11:30      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<b>0.23</b>	ug/m3	0.16	0.11	5.09		01/03/18 17:23	56-23-5	
Chloroform	<b>0.12</b>	ug/m3	0.080	0.061	3.24		12/29/17 15:40	67-66-3	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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**Sample: SSV-3-121917**      **Lab ID: 10415471003**      Collected: 12/19/17 18:31      Received: 12/22/17 11:30      Matrix: Air

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR SIM SCAN</b>		Analytical Method: TO-15							
Carbon tetrachloride	<b>1.8</b>	ug/m3	0.11	0.077	3.44		12/29/17 16:08	56-23-5	
Chloroform	<b>1.8</b>	ug/m3	0.085	0.065	3.44		12/29/17 16:08	67-66-3	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

QC Batch: 516063

Analysis Method: TO-15

QC Batch Method: TO-15

Analysis Description: TO15 MSV AIR SIM SCAN

Associated Lab Samples: 10415471001, 10415471002, 10415471003

METHOD BLANK: 2805116

Matrix: Air

Associated Lab Samples: 10415471001, 10415471002, 10415471003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Carbon tetrachloride	ug/m3	<0.022	0.032	0.022	01/03/18 14:17	
Chloroform	ug/m3	<0.019	0.025	0.019	01/03/18 14:17	

LABORATORY CONTROL SAMPLE: 2805117

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbon tetrachloride	ug/m3	.64	0.65	102	70-130	
Chloroform	ug/m3	.5	0.53	107	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 661508.10.02.03 Freeman UPRR

Pace Project No.: 10415471

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10415471001	SSV-1-121917	TO-15	516063		
10415471002	SSV-2-121917	TO-15	516063		
10415471003	SSV-3-121917	TO-15	516063		

### REPORT OF LABORATORY ANALYSIS

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# AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10415471

30597

Page: 1 of 1

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:	<b>Program</b>
Company: CH2M	Report To: Steve Demus	Attention:	<input type="checkbox"/> UST <input type="checkbox"/> Superfund <input type="checkbox"/> Emissions <input type="checkbox"/> Clean Air Act
Address: 999 W Riverside Ave	Copy To:	Company Name:	<input type="checkbox"/> Voluntary Clean Up <input type="checkbox"/> Dry Clean <input type="checkbox"/> RCRA <input type="checkbox"/> Other
Suite 500, Spokane, WA		Address:	
Email To: Steve.demus@ch2m.com	Purchase Order No.: 1030099	Pace Quote Reference:	
Phone: 509.944.1785	Project Name: Freeman UPR	Pace Project Manager/Sales Rep.	Location of Sampling by State: WA
Requested Due Date/TAT:	Project Number: 1061508.1A.02.03	Pace Profile #: 37080	Reporting Units: ug/m <sup>3</sup> <input checked="" type="checkbox"/> mg/m <sup>3</sup> <input type="checkbox"/> PPBV <input type="checkbox"/> PPMV <input type="checkbox"/> Other <input type="checkbox"/>
			Report Level: II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> Other <input type="checkbox"/>

ITEM #	'Section D Required Client Information <b>AIR SAMPLE ID</b> Sample IDs MUST BE UNIQUE	Valid Media Codes MEDIA CODE Tedlar Bag TB 1 Liter Summa Can 1LC 6 Liter Summa Can 6LC Low Volume Puff LVP High Volume Puff HVP Other PM10	MEDIA CODE	PID Reading (Client only)	COLLECTED				Canister Pressure (Initial Field - in Hg)	Canister Pressure (Final Field - in Hg)	Summa Can Number	Flow Control Number	Method:								Pace Lab ID	
					COMPOSITE START		COMPOSITE - END/GRAB						PM10	3C - Fixed Gas (%)	TO-3 BTEX	TO-3M (Methane)	TO-14	TO-15 Full List VOCs	TO-15 Short List BTEX	TO-15 Short List Chlorinated		TO-15 Short List (Other)
					DATE	TIME	DATE	TIME														
1	SSV-1-121917		1LC			12/19/17	12:34	26.67	2.21	2902	0073										001	
2	SSV-2-121917		1LC			12/19/17	16:56	26.29	4.40	1331	0075											002
3	SSV-3-121917		1LC			12/19/17	18:31	26.48	4.90	2782	0172											003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

Comments :

Analysis for  
chloroform and  
carbon tetrachloride

2

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
Chase Holton	12/20	9:00	Steve Pace	12/22/17	11:30	-	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> Y
							<input type="checkbox"/> Y	<input type="checkbox"/> Y	<input type="checkbox"/> Y	<input type="checkbox"/> Y
							<input type="checkbox"/> Y	<input type="checkbox"/> Y	<input type="checkbox"/> Y	<input type="checkbox"/> Y
							<input type="checkbox"/> Y	<input type="checkbox"/> Y	<input type="checkbox"/> Y	<input type="checkbox"/> Y


SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
PRINT Name of SAMPLER: Chase Holton					
SIGNATURE of SAMPLER: <i>Chase Holton</i> DATE Signed (MM/DD/YY): 12/20/2017					



**Air Sample Condition Upon Receipt**

Client Name: CH2M Project #: \_\_\_\_\_

**WO# : 10415471**



10415471

Courier:  Fed Ex  UPS  Speedee  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: 747630037909

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  Foam  None  Tin Can  Other: \_\_\_\_\_ Temp Blank rec:  Yes  No

Temp. (TO17 and TO13 samples only) (°C): \_\_\_\_\_ Corrected Temp (°C): \_\_\_\_\_ Thermom. Used:  151401163  G87A9155100842

Temp should be above freezing to 6°C Correction Factor: \_\_\_\_\_ Date & Initials of Person Examining Contents: R6/12/22/17

Type of ice Received  Blue  Wet  None

				Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Media: <u>Air Can</u> Airbag Filter TDT Passive				11. Individually Certified Cans <u>Y</u> <u>N</u> (list which samples)
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	12.

Samples Received: FFFT

Canisters					Canisters				
Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure	Sample Number	Can ID	Flow Controller	Initial Pressure	Final Pressure
<u>SSV-1</u>			<u>-4</u>	<u>10</u>					
<u>11-2</u>			<u>-7</u>	<u>10</u>					
<u>11-3</u>			<u>-7</u>	<u>10</u>					
<u>trace unused</u>	<u>2788</u>	<u>0183</u>	<u>-26</u>	<u>-22</u>	<u>R6/12/22/17</u>				
<u>11</u>	<u>1332</u>	<u>0393</u>	<u>-27</u>						

**CLIENT NOTIFICATION/RESOLUTION** Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Project Manager Review: [Signature] Date: 12/22/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

January 11, 2018

David Hodson  
CH2M Hill  
9451 Atkinson St  
Suite 100  
Roseville, CA 95747

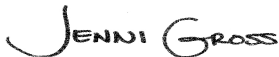
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416296

Dear David Hodson:

Enclosed are the analytical results for sample(s) received by the laboratory on January 05, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
Steve Demus, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10416296001	STARK-GW-010418	Water	01/04/18 12:55	01/05/18 10:15
10416296002	ATWOODS-GW-010418	Water	01/04/18 13:45	01/05/18 10:15
10416296003	ATWOODH-GW-010418	Water	01/04/18 14:15	01/05/18 10:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10416296001	STARK-GW-010418	RSK 175	MJL	3	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416296002	ATWOODS-GW-010418	RSK 175	MJL	3	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416296003	ATWOODH-GW-010418	RSK 175	MJL	3	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	JLM	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10416296001</b>	<b>STARK-GW-010418</b>					
RSK 175	Methane	2.2J	ug/L	10.0	01/08/18 10:18	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	106	mg/L	5.0	01/10/18 08:15	
SM 2540C	Total Dissolved Solids	261	mg/L	10.0	01/05/18 14:05	
EPA 300.0	Chloride	1.3	mg/L	1.2	01/05/18 18:16	B,M1
EPA 300.0	Nitrate as N	14.4	mg/L	1.0	01/05/18 21:04	M6
EPA 300.0	Sulfate	10.9	mg/L	1.2	01/05/18 18:16	M1
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	15.5	mg/L	0.40	01/11/18 11:31	
SM 5310C	Total Organic Carbon	0.38J	mg/L	1.0	01/09/18 16:14	
<b>10416296002</b>	<b>ATWOODS-GW-010418</b>					
RSK 175	Methane	3.7J	ug/L	10.0	01/08/18 10:25	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	148	mg/L	5.0	01/10/18 08:19	
SM 2540C	Total Dissolved Solids	207	mg/L	10.0	01/05/18 14:05	
EPA 300.0	Chloride	1.4	mg/L	1.2	01/05/18 19:18	B
EPA 300.0	Nitrate as N	1.2	mg/L	0.10	01/05/18 19:18	
EPA 300.0	Sulfate	3.8	mg/L	1.2	01/05/18 19:18	B
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	1.3	mg/L	0.020	01/11/18 11:01	
SM 5310C	Total Organic Carbon	0.34J	mg/L	1.0	01/09/18 16:53	
<b>10416296003</b>	<b>ATWOODH-GW-010418</b>					
RSK 175	Methane	3.5J	ug/L	10.0	01/08/18 10:33	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	146	mg/L	5.0	01/10/18 08:24	
SM 2540C	Total Dissolved Solids	196	mg/L	10.0	01/05/18 14:05	
EPA 300.0	Chloride	1.4	mg/L	1.2	01/05/18 20:04	B
EPA 300.0	Nitrate as N	0.49	mg/L	0.10	01/05/18 20:04	
EPA 300.0	Sulfate	4.0	mg/L	1.2	01/05/18 20:04	B
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	0.54	mg/L	0.020	01/11/18 11:02	
SM 5310C	Total Organic Carbon	0.35J	mg/L	1.0	01/09/18 17:32	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416296

---

**Method:** EPA 300.0  
**Description:** 300.0 IC Anions  
**Client:** UPRR\_CH2M Hill  
**Date:** January 11, 2018

### General Information:

3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 516881

- B: Analyte was detected in the associated method blank.
- BLANK for HBN 516881 [WETA/339 (Lab ID: 2808512)]
    - Chloride
    - Sulfate

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 516881

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10416296001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2808514)
  - Chloride
  - Sulfate
- MSD (Lab ID: 2808515)
  - Sulfate

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 2808514)
  - Nitrate as N
- MSD (Lab ID: 2808515)
  - Nitrate as N

### Additional Comments:

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

---

**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 11, 2018

**General Information:**

3 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

**Sample: STARK-GW-010418**      **Lab ID: 10416296001**      Collected: 01/04/18 12:55      Received: 01/05/18 10:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/08/18 10:18	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/08/18 10:18	74-85-1	
Methane	2.2J	ug/L	10.0	1.1	1		01/08/18 10:18	74-82-8	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	106	mg/L	5.0	1.4	1		01/10/18 08:15		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	261	mg/L	10.0	5.0	1		01/05/18 14:05		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/08/18 13:37	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.3	mg/L	1.2	0.14	1		01/05/18 18:16	16887-00-6	B,M1
Nitrate as N	14.4	mg/L	1.0	0.079	10		01/05/18 21:04	14797-55-8	M6
Sulfate	10.9	mg/L	1.2	0.27	1		01/05/18 18:16	14808-79-8	M1
<b>353.2 Nitrate + Nitrite</b> Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	15.5	mg/L	0.40	0.15	20		01/11/18 11:31		
<b>410.4 COD</b> Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:34		
<b>5310C TOC</b> Analytical Method: SM 5310C									
Total Organic Carbon	0.38J	mg/L	1.0	0.20	1		01/09/18 16:14	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

**Sample: ATWOODS-GW-010418**      **Lab ID: 10416296002**      Collected: 01/04/18 13:45      Received: 01/05/18 10:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>									
Analytical Method: RSK 175									
Ethane	<b>&lt;4.9</b>	ug/L	10.0	4.9	1		01/08/18 10:25	74-84-0	
Ethene	<b>&lt;0.68</b>	ug/L	10.0	0.68	1		01/08/18 10:25	74-85-1	
Methane	<b>3.7J</b>	ug/L	10.0	1.1	1		01/08/18 10:25	74-82-8	
<b>2320B Alkalinity</b>									
Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	<b>148</b>	mg/L	5.0	1.4	1		01/10/18 08:19		
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C									
Total Dissolved Solids	<b>207</b>	mg/L	10.0	5.0	1		01/05/18 14:05		
<b>4500S2D Sulfide, Total</b>									
Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<b>&lt;0.0050</b>	mg/L	0.020	0.0050	1		01/08/18 13:39	18496-25-8	
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0									
Chloride	<b>1.4</b>	mg/L	1.2	0.14	1		01/05/18 19:18	16887-00-6	B
Nitrate as N	<b>1.2</b>	mg/L	0.10	0.0079	1		01/05/18 19:18	14797-55-8	
Sulfate	<b>3.8</b>	mg/L	1.2	0.27	1		01/05/18 19:18	14808-79-8	B
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>1.3</b>	mg/L	0.020	0.0075	1		01/11/18 11:01		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:34		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.34J</b>	mg/L	1.0	0.20	1		01/09/18 16:53	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416296

**Sample:** ATWOODH-GW-010418    **Lab ID:** 10416296003    Collected: 01/04/18 14:15    Received: 01/05/18 10:15    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>									
Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/08/18 10:33	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/08/18 10:33	74-85-1	
Methane	3.5J	ug/L	10.0	1.1	1		01/08/18 10:33	74-82-8	
<b>2320B Alkalinity</b>									
Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	146	mg/L	5.0	1.4	1		01/10/18 08:24		
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C									
Total Dissolved Solids	196	mg/L	10.0	5.0	1		01/05/18 14:05		
<b>4500S2D Sulfide, Total</b>									
Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/08/18 13:40	18496-25-8	
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0									
Chloride	1.4	mg/L	1.2	0.14	1		01/05/18 20:04	16887-00-6	B
Nitrate as N	0.49	mg/L	0.10	0.0079	1		01/05/18 20:04	14797-55-8	
Sulfate	4.0	mg/L	1.2	0.27	1		01/05/18 20:04	14808-79-8	B
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	0.54	mg/L	0.020	0.0075	1		01/11/18 11:02		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<15.8	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:36		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	0.35J	mg/L	1.0	0.20	1		01/09/18 17:32	7440-44-0	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416296

QC Batch: 517392 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 2811130 Matrix: Water  
Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<1.4	5.0	1.4	01/10/18 07:58	

LABORATORY CONTROL SAMPLE & LCSD: 2811131 2811132

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	40	40.5	40.9	101	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2811133 2811134

Parameter	Units	10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	143	40	40	185	182	105	98	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2811135 2811136

Parameter	Units	10416543002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	110	40	40	151	154	104	111	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

QC Batch: 516911

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 2808737

Matrix: Water

Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	01/05/18 14:05	

LABORATORY CONTROL SAMPLE: 2808738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	968	97	80-120	

SAMPLE DUPLICATE: 2808739

Parameter	Units	10416033001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1960	1950	1	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

QC Batch: 98614 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 424524 Matrix: Water

Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	01/08/18 13:35	

LABORATORY CONTROL SAMPLE: 424525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	94	90-110	

MATRIX SPIKE SAMPLE: 424527

Parameter	Units	10416296001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.19	96	75-125	

SAMPLE DUPLICATE: 424526

Parameter	Units	10416296001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

QC Batch: 516881 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 2808512 Matrix: Water

Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.28J	1.2	0.14	01/05/18 17:22	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	01/05/18 17:22	
Sulfate	mg/L	0.43J	1.2	0.27	01/05/18 17:22	

LABORATORY CONTROL SAMPLE: 2808513

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	11.9	95	90-110	
Nitrate as N	mg/L	1	0.91	91	90-110	
Sulfate	mg/L	12.5	12.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2808514 2808515

Parameter	Units	2808514		2808515		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10416296001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	1.3	12.5	12.5	11.5	12.7	82	91	90-110	10	20 M1
Nitrate as N	mg/L	14.4	10	10	23.2	23.0	88	86	90-110	1	20 M6
Sulfate	mg/L	10.9	12.5	12.5	19.1	21.1	66	82	90-110	10	20 M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416296

QC Batch: 517662 Analysis Method: EPA 353.2  
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 2812360 Matrix: Water  
Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	01/11/18 11:29	

LABORATORY CONTROL SAMPLE: 2812361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2812362 2812363

Parameter	Units	10416448001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	0.97	0.94	96	93	90-110	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2812364 2812365

Parameter	Units	10416798001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max		Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.98	0.94	98	94	90-110	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

QC Batch: 517041 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 2809437 Matrix: Water

Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	01/10/18 13:31	

LABORATORY CONTROL SAMPLE: 2809438

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	310	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809439 2809440

Parameter	Units	10416375001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chemical Oxygen Demand	mg/L	1370	2500	2500	4050	4060	107	108	90-110	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809441 2809442

Parameter	Units	10416448001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chemical Oxygen Demand	mg/L	<15.8	250	250	254	251	102	100	90-110	1	20		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

QC Batch: 134871

Analysis Method: SM 5310C

QC Batch Method: SM 5310C

Analysis Description: 5310C TOC

Associated Lab Samples: 10416296001, 10416296002, 10416296003

METHOD BLANK: 537122

Matrix: Water

Associated Lab Samples: 10416296001, 10416296002, 10416296003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	01/09/18 14:57	

LABORATORY CONTROL SAMPLE: 537123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	25.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 537124 537125

Parameter	Units	537124		537125		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10416296001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Total Organic Carbon	mg/L	0.38J	25	25	25.6	25.7	101	101	80-120	0	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416296

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416296

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10416296001	STARK-GW-010418	RSK 175	517038		
10416296002	ATWOODS-GW-010418	RSK 175	517038		
10416296003	ATWOODH-GW-010418	RSK 175	517038		
10416296001	STARK-GW-010418	SM 2320B	517392		
10416296002	ATWOODS-GW-010418	SM 2320B	517392		
10416296003	ATWOODH-GW-010418	SM 2320B	517392		
10416296001	STARK-GW-010418	SM 2540C	516911		
10416296002	ATWOODS-GW-010418	SM 2540C	516911		
10416296003	ATWOODH-GW-010418	SM 2540C	516911		
10416296001	STARK-GW-010418	SM 4500-S-2 D	98614		
10416296002	ATWOODS-GW-010418	SM 4500-S-2 D	98614		
10416296003	ATWOODH-GW-010418	SM 4500-S-2 D	98614		
10416296001	STARK-GW-010418	EPA 300.0	516881		
10416296002	ATWOODS-GW-010418	EPA 300.0	516881		
10416296003	ATWOODH-GW-010418	EPA 300.0	516881		
10416296001	STARK-GW-010418	EPA 353.2	517662		
10416296002	ATWOODS-GW-010418	EPA 353.2	517662		
10416296003	ATWOODH-GW-010418	EPA 353.2	517662		
10416296001	STARK-GW-010418	EPA 410.4	517041	EPA 410.4	517519
10416296002	ATWOODS-GW-010418	EPA 410.4	517041	EPA 410.4	517519
10416296003	ATWOODH-GW-010418	EPA 410.4	517041	EPA 410.4	517519
10416296001	STARK-GW-010418	SM 5310C	134871		
10416296002	ATWOODS-GW-010418	SM 5310C	134871		
10416296003	ATWOODH-GW-010418	SM 5310C	134871		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt - ESI  
 Tech Specs

Client Name: CH2M HILL Project #: \_\_\_\_\_

**WO# : 10416296**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7475 9636 4408  
 Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No  
 Thermometer  151401163  G87A9155100842 Type of Ice:  Wet  Blue  None  Dry  Melted  
 Cooler Temp Read (°C): 0.4 Cooler Temp Corrected (°C): 0.6 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.2 Date and Initials of Person Examining Contents: ME 1/5/18  
 USDA Regulated Soil  N/A, water sample  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (Internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	Yes	No	N/A	COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		6.
Rush Turn Around Time Requested?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		8.
Correct Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9.
-Pace Containers Used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Containers Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>				
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input checked="" type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Sample # <u>1-3</u> <u>1/1</u> <u>1/1</u>
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	14.
3 Trip Blanks Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Field Data Required?  Yes  No

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1025</u>	Temp: <u>0.4</u>	Corrected Temp: <u>0.6</u>
Time: <u>1032</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_

Note: Whenever there is a discrepancy affecting North Carolina compliance hold, incorrect preservative, out of temp, incorrect containers)

JENNI GROSS

Date: 01/05/18

m will be sent to the North Carolina DEHNR Certification Office (i.e. out of

Chain of Custody \_\_\_\_\_

WO#: 2068358



Workorder: 10416296

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 1/5/2018

Results Requested By: 1/19/2018

Report To		Subcontract To					Requested Analysis																							
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					<div style="display: flex; justify-content: space-between;"> <span>5636267 / 4500 Sulfide</span> <span>LAB USE ONLY</span> </div>																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other																								
1	STARK-GW-010418	PS	1/4/2018 12:55	10416296001	Water	1																								
2	ATWOODS-GW-010418	PS	1/4/2018 13:45	10416296002	Water	1																								
3	ATWOODH-GW-010418	PS	1/4/2018 14:15	10416296003	Water	1																								
4																														
5																														

Transfers					Comments				
Released By	Date/Time	Received By	Date/Time						
<i>[Signature]</i>	1/5/18 1930	<i>[Signature]</i>	1/6/18 900						
FEDEX	1/6/18 900	<i>[Signature]</i>	1/6/18 900						

Cooler Temperature on Receipt 1.3 °C    Custody Seal Y or N    Received on Ice Y or N    Samples Intact Y or N

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon Re

Proje

# WO#: 2068358

PM: CMM

Due Date: 01/19/18

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals Intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 01-06-18 JB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present?"	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	1 x Liter 's each
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_





**Sample Condition Upon Receipt**

Client Name: Pace Seattle Project #:

**WO#: 12103400**  
 PM: HRZ Due Date: 01/19/18  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 0.4 Cooler Temp Corrected °C: 0.7 Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C Correction Factor: 1.0.3 Date and Initials of Person Examining Contents: 1-5-18 DC

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N

TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: Hester 3rd Date: 1/9/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

January 08, 2018

Steve Demus  
CH2M Hill  
9 S. Washington  
Suite 400  
Spokane, WA 99201

RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416300

Dear Steve Demus:

Enclosed are the analytical results for sample(s) received by the laboratory on January 05, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
David Hodson, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10416300001	STARK-GW-010418	Water	01/04/18 12:55	01/05/18 10:15
10416300002	ATWOODS-GW-010418	Water	01/04/18 13:45	01/05/18 10:15
10416300003	ATWOODH-GW-010418	Water	01/04/18 14:15	01/05/18 10:15

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10416300001	STARK-GW-010418	EPA 8260B	DJB	83	PASI-M
10416300002	ATWOODS-GW-010418	EPA 8260B	DJB	83	PASI-M
10416300003	ATWOODH-GW-010418	EPA 8260B	DJB	83	PASI-M

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

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**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** January 08, 2018

### General Information:

3 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- ATWOODH-GW-010418 (Lab ID: 10416300003)
- ATWOODS-GW-010418 (Lab ID: 10416300002)
- STARK-GW-010418 (Lab ID: 10416300001)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 516886

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10416484001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2809668)
  - Acetone
  - Bromomethane
  - Chloromethane
  - Tetrahydrofuran
- MSD (Lab ID: 2809669)
  - Acetone
  - Bromomethane

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** January 08, 2018

QC Batch: 516886

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10416484001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- Chloromethane
- Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416300

Sample: **STARK-GW-010418** Lab ID: **10416300001** Collected: 01/04/18 12:55 Received: 01/05/18 10:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/05/18 20:17	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/05/18 20:17	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/05/18 20:17	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/05/18 20:17	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:17	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:17	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/05/18 20:17	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:17	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/05/18 20:17	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/05/18 20:17	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/05/18 20:17	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/05/18 20:17	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/05/18 20:17	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/05/18 20:17	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/05/18 20:17	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:17	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/05/18 20:17	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/05/18 20:17	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/05/18 20:17	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/05/18 20:17	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/05/18 20:17	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/05/18 20:17	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/05/18 20:17	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/05/18 20:17	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/05/18 20:17	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/05/18 20:17	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/05/18 20:17	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/05/18 20:17	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/05/18 20:17	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/05/18 20:17	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/05/18 20:17	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/05/18 20:17	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/05/18 20:17	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/05/18 20:17	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/05/18 20:17	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/05/18 20:17	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/05/18 20:17	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/05/18 20:17	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

**Sample: STARK-GW-010418**      **Lab ID: 10416300001**      Collected: 01/04/18 12:55      Received: 01/05/18 10:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/05/18 20:17	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/05/18 20:17	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/05/18 20:17	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/05/18 20:17	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/05/18 20:17	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/05/18 20:17	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/05/18 20:17	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/05/18 20:17	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/05/18 20:17	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/05/18 20:17	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/05/18 20:17	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/05/18 20:17	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/05/18 20:17	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/05/18 20:17	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/05/18 20:17	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/05/18 20:17	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/05/18 20:17	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/05/18 20:17	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/05/18 20:17	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/05/18 20:17	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/05/18 20:17	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/05/18 20:17	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/05/18 20:17	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/05/18 20:17	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/05/18 20:17	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:17	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/05/18 20:17	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		01/05/18 20:17	17060-07-0	
Toluene-d8 (S)	99	%	75-125		1		01/05/18 20:17	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		01/05/18 20:17	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

Sample: **ATWOODS-GW-010418** Lab ID: **10416300002** Collected: 01/04/18 13:45 Received: 01/05/18 10:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/05/18 20:40	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/05/18 20:40	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/05/18 20:40	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/05/18 20:40	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:40	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:40	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/05/18 20:40	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:40	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/05/18 20:40	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/05/18 20:40	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/05/18 20:40	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/05/18 20:40	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/05/18 20:40	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/05/18 20:40	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/05/18 20:40	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/05/18 20:40	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/05/18 20:40	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/05/18 20:40	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/05/18 20:40	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/05/18 20:40	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/05/18 20:40	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/05/18 20:40	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/05/18 20:40	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/05/18 20:40	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/05/18 20:40	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/05/18 20:40	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/05/18 20:40	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/05/18 20:40	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/05/18 20:40	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/05/18 20:40	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/05/18 20:40	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/05/18 20:40	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/05/18 20:40	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/05/18 20:40	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/05/18 20:40	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/05/18 20:40	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/05/18 20:40	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/05/18 20:40	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

**Sample: ATWOODS-GW-010418**    **Lab ID: 10416300002**    Collected: 01/04/18 13:45    Received: 01/05/18 10:15    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/05/18 20:40	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/05/18 20:40	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/05/18 20:40	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/05/18 20:40	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/05/18 20:40	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/05/18 20:40	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/05/18 20:40	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/05/18 20:40	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/05/18 20:40	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/05/18 20:40	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/05/18 20:40	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/05/18 20:40	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/05/18 20:40	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/05/18 20:40	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/05/18 20:40	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/05/18 20:40	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/05/18 20:40	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/05/18 20:40	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/05/18 20:40	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/05/18 20:40	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/05/18 20:40	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/05/18 20:40	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/05/18 20:40	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/05/18 20:40	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/05/18 20:40	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/05/18 20:40	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/05/18 20:40	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	102	%	75-137		1		01/05/18 20:40	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		01/05/18 20:40	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		01/05/18 20:40	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416300

Sample: **ATWOODH-GW-010418** Lab ID: **10416300003** Collected: 01/04/18 14:15 Received: 01/05/18 10:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/05/18 21:04	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/05/18 21:04	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/05/18 21:04	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/05/18 21:04	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/05/18 21:04	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/05/18 21:04	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/05/18 21:04	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/05/18 21:04	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/05/18 21:04	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/05/18 21:04	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/05/18 21:04	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/05/18 21:04	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/05/18 21:04	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/05/18 21:04	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/05/18 21:04	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/05/18 21:04	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/05/18 21:04	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/05/18 21:04	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/05/18 21:04	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/05/18 21:04	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/05/18 21:04	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/05/18 21:04	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/05/18 21:04	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/05/18 21:04	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/05/18 21:04	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/05/18 21:04	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/05/18 21:04	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/05/18 21:04	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/05/18 21:04	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/05/18 21:04	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/05/18 21:04	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/05/18 21:04	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/05/18 21:04	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/05/18 21:04	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/05/18 21:04	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/05/18 21:04	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/05/18 21:04	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/05/18 21:04	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

**Sample: ATWOODH-GW-010418**    **Lab ID: 10416300003**    Collected: 01/04/18 14:15    Received: 01/05/18 10:15    Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/05/18 21:04	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/05/18 21:04	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/05/18 21:04	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/05/18 21:04	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/05/18 21:04	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/05/18 21:04	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/05/18 21:04	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/05/18 21:04	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/05/18 21:04	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/05/18 21:04	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/05/18 21:04	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/05/18 21:04	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/05/18 21:04	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/05/18 21:04	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/05/18 21:04	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/05/18 21:04	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/05/18 21:04	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/05/18 21:04	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/05/18 21:04	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/05/18 21:04	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/05/18 21:04	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/05/18 21:04	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/05/18 21:04	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/05/18 21:04	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/05/18 21:04	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/05/18 21:04	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/05/18 21:04	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		01/05/18 21:04	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		01/05/18 21:04	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		01/05/18 21:04	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

QC Batch: 516886 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10416300001, 10416300002, 10416300003

METHOD BLANK: 2808586 Matrix: Water

Associated Lab Samples: 10416300001, 10416300002, 10416300003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	01/05/18 15:35	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	01/05/18 15:35	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	01/05/18 15:35	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	01/05/18 15:35	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	01/05/18 15:35	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	01/05/18 15:35	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	01/05/18 15:35	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	01/05/18 15:35	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	01/05/18 15:35	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	01/05/18 15:35	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	01/05/18 15:35	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	01/05/18 15:35	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	01/05/18 15:35	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	01/05/18 15:35	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	01/05/18 15:35	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	01/05/18 15:35	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	01/05/18 15:35	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	01/05/18 15:35	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	01/05/18 15:35	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	01/05/18 15:35	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	01/05/18 15:35	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	01/05/18 15:35	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	01/05/18 15:35	
2-Hexanone	ug/L	<2.5	5.0	2.5	01/05/18 15:35	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	01/05/18 15:35	
Acetone	ug/L	<8.8	20.0	8.8	01/05/18 15:35	
Acrolein	ug/L	<4.8	10.0	4.8	01/05/18 15:35	
Acrylonitrile	ug/L	<4.9	10.0	4.9	01/05/18 15:35	
Benzene	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
Bromobenzene	ug/L	<0.16	0.50	0.16	01/05/18 15:35	
Bromochloromethane	ug/L	<0.38	1.0	0.38	01/05/18 15:35	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	01/05/18 15:35	
Bromoform	ug/L	<1.0	4.0	1.0	01/05/18 15:35	
Bromomethane	ug/L	<1.5	4.0	1.5	01/05/18 15:35	
Carbon disulfide	ug/L	<0.37	1.0	0.37	01/05/18 15:35	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	01/05/18 15:35	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

METHOD BLANK: 2808586

Matrix: Water

Associated Lab Samples: 10416300001, 10416300002, 10416300003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
Chloroethane	ug/L	<0.44	1.0	0.44	01/05/18 15:35	
Chloroform	ug/L	<0.46	1.0	0.46	01/05/18 15:35	
Chloromethane	ug/L	<1.1	4.0	1.1	01/05/18 15:35	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	01/05/18 15:35	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	01/05/18 15:35	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
Dibromomethane	ug/L	<0.50	1.0	0.50	01/05/18 15:35	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	01/05/18 15:35	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	01/05/18 15:35	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	01/05/18 15:35	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
Ethylbenzene	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	01/05/18 15:35	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
m&p-Xylene	ug/L	<0.24	1.0	0.24	01/05/18 15:35	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
Methylene Chloride	ug/L	<1.2	4.0	1.2	01/05/18 15:35	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	01/05/18 15:35	
Naphthalene	ug/L	<0.42	1.0	0.42	01/05/18 15:35	
o-Xylene	ug/L	<0.11	0.50	0.11	01/05/18 15:35	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	01/05/18 15:35	
Styrene	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	01/05/18 15:35	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	01/05/18 15:35	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	01/05/18 15:35	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	01/05/18 15:35	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	01/05/18 15:35	
Toluene	ug/L	<0.17	0.50	0.17	01/05/18 15:35	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	01/05/18 15:35	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	01/05/18 15:35	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	01/05/18 15:35	
Trichloroethene	ug/L	<0.18	0.40	0.18	01/05/18 15:35	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	01/05/18 15:35	
Vinyl acetate	ug/L	<1.5	10.0	1.5	01/05/18 15:35	
Vinyl chloride	ug/L	<0.096	0.20	0.096	01/05/18 15:35	
Xylene (Total)	ug/L	<0.24	1.5	0.24	01/05/18 15:35	
1,2-Dichloroethane-d4 (S)	%	99	75-137		01/05/18 15:35	
4-Bromofluorobenzene (S)	%	98	75-125		01/05/18 15:35	
Toluene-d8 (S)	%	98	75-125		01/05/18 15:35	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

LABORATORY CONTROL SAMPLE: 2808587

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	17.3	87	75-136	
1,1,1-Trichloroethane	ug/L	20	17.1	85	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	16.3	81	71-138	
1,1,2-Trichloroethane	ug/L	20	18.7	93	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	16.6	83	69-126	
1,1-Dichloroethane	ug/L	20	16.7	84	75-125	
1,1-Dichloroethene	ug/L	20	16.8	84	75-125	
1,1-Dichloropropene	ug/L	20	16.5	83	75-125	
1,2,3-Trichlorobenzene	ug/L	20	17.7	89	75-125	
1,2,3-Trichloropropane	ug/L	20	17.1	85	75-125	
1,2,4-Trichlorobenzene	ug/L	20	16.8	84	75-125	
1,2,4-Trimethylbenzene	ug/L	20	16.6	83	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	41.8	84	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	16.8	84	75-125	
1,2-Dichlorobenzene	ug/L	20	17.2	86	75-125	
1,2-Dichloroethane	ug/L	20	16.7	83	70-125	
1,2-Dichloroethene (Total)	ug/L	40	34.2	86	75-125	
1,2-Dichloropropane	ug/L	20	17.0	85	75-125	
1,3,5-Trimethylbenzene	ug/L	20	17.3	87	75-125	
1,3-Dichlorobenzene	ug/L	20	16.9	85	75-125	
1,3-Dichloropropane	ug/L	20	17.6	88	75-125	
1,4-Dichlorobenzene	ug/L	20	16.8	84	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	348	87	64-140	
2,2,4-Trimethylpentane	ug/L	20	16.9	85	68-125	
2,2-Dichloropropane	ug/L	20	17.9	89	70-131	
2-Butanone (MEK)	ug/L	100	84.7	85	69-125	
2-Chlorotoluene	ug/L	20	16.8	84	75-125	
2-Hexanone	ug/L	100	83.7	84	73-129	
4-Chlorotoluene	ug/L	20	18.0	90	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	89.6	90	73-125	
Acetone	ug/L	100	114	114	66-126	
Acrolein	ug/L	200	175	88	56-150	
Acrylonitrile	ug/L	200	172	86	68-129	
Benzene	ug/L	20	17.0	85	75-125	
Bromobenzene	ug/L	20	17.3	86	75-125	
Bromochloromethane	ug/L	20	17.2	86	75-126	
Bromodichloromethane	ug/L	20	16.9	84	75-133	
Bromoform	ug/L	20	18.2	91	62-142	
Bromomethane	ug/L	20	25.9	129	34-143	
Carbon disulfide	ug/L	20	13.7	68	71-125 L2	
Carbon tetrachloride	ug/L	20	16.7	84	71-145	
Chlorobenzene	ug/L	20	16.8	84	75-125	
Chloroethane	ug/L	20	15.4	77	75-125	
Chloroform	ug/L	20	17.0	85	75-125	
Chloromethane	ug/L	20	21.5	107	54-125	
cis-1,2-Dichloroethene	ug/L	20	17.8	89	75-125	
cis-1,3-Dichloropropene	ug/L	20	19.3	97	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

LABORATORY CONTROL SAMPLE: 2808587

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	17.3	86	74-141	
Dibromomethane	ug/L	20	17.7	88	75-125	
Dichlorodifluoromethane	ug/L	20	17.6	88	59-130	
Dichlorofluoromethane	ug/L	20	16.9	84	75-125	
Diisopropyl ether	ug/L	20	17.6	88	69-125	
Ethyl-tert-butyl ether	ug/L	20	17.7	89	73-125	
Ethylbenzene	ug/L	20	17.8	89	75-125	
Hexachloro-1,3-butadiene	ug/L	20	17.5	87	75-131	
Isopropylbenzene (Cumene)	ug/L	20	16.9	85	75-125	
m&p-Xylene	ug/L	40	36.3	91	75-125	
Methyl-tert-butyl ether	ug/L	20	17.8	89	75-125	
Methylene Chloride	ug/L	20	16.0	80	73-125	
n-Butylbenzene	ug/L	20	16.6	83	75-125	
n-Propylbenzene	ug/L	20	17.4	87	75-125	
Naphthalene	ug/L	20	15.2	76	74-125	
o-Xylene	ug/L	20	16.7	84	75-125	
p-Isopropyltoluene	ug/L	20	17.6	88	75-125	
sec-Butylbenzene	ug/L	20	17.7	89	75-125	
Styrene	ug/L	20	18.5	92	75-125	
tert-Amylmethyl ether	ug/L	20	17.8	89	71-126	
tert-Butyl Alcohol	ug/L	200	189	95	69-131	
tert-Butylbenzene	ug/L	20	16.9	85	75-125	
Tetrachloroethene	ug/L	20	17.4	87	75-125	
Tetrahydrofuran	ug/L	200	223	112	65-127	
Toluene	ug/L	20	16.6	83	75-125	
trans-1,2-Dichloroethene	ug/L	20	16.4	82	75-125	
trans-1,3-Dichloropropene	ug/L	20	17.3	86	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	42.8	86	30-150	
Trichloroethene	ug/L	20	18.6	93	75-125	
Trichlorofluoromethane	ug/L	20	17.0	85	71-140	
Vinyl acetate	ug/L	20	16.3	82	68-137	
Vinyl chloride	ug/L	20	17.3	86	70-125	
Xylene (Total)	ug/L	60	53.0	88	75-125	
1,2-Dichloroethane-d4 (S)	%			96	75-137	
4-Bromofluorobenzene (S)	%			98	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809668 2809669

Parameter	Units	2809668		2809669		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	21.3	18.5	106	92	75-137	14	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	22.2	19.5	111	97	75-139	13	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	19.3	17.9	97	90	60-142	7	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	21.9	19.7	110	98	75-128	11	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

Parameter	Units	2809668		2809669		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10416484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	23.7	20.5	118	102	62-150	14	30		
1,1-Dichloroethane	ug/L	0.47J	20	20	21.2	18.9	104	92	70-129	12	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	21.6	19.3	108	96	67-141	11	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	21.5	19.2	108	96	64-144	12	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	22.7	22.0	114	110	66-139	3	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	20.5	19.3	102	97	69-134	6	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	21.3	19.7	106	99	65-138	7	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	19.9	18.6	100	93	65-143	7	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	48.1	45.3	96	91	61-134	6	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	20.1	17.9	101	90	74-129	12	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	20.5	19.6	102	98	68-135	4	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	19.9	17.4	99	87	73-125	13	30		
1,2-Dichloroethene (Total)	ug/L	0.69J	40	40	42.1	37.9	103	93	69-134	10	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	20.4	18.2	102	91	64-130	11	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	20.9	19.2	105	96	64-146	8	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	19.9	19.0	100	95	69-135	5	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	20.6	19.0	103	95	67-128	8	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	20.0	18.6	100	93	66-134	7	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	460	405	115	101	58-140	13	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	25.2	21.5	126	108	48-150	16	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	22.8	20.0	114	100	50-150	13	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	97.9	90.4	98	90	58-125	8	30		
2-Chlorotoluene	ug/L	<0.20	20	20	19.1	18.5	95	93	65-138	3	30		
2-Hexanone	ug/L	<2.5	100	100	97.2	89.2	97	89	61-134	9	30		
4-Chlorotoluene	ug/L	<0.13	20	20	21.1	20.1	106	100	68-135	5	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	105	95.4	105	95	61-130	10	30		
Acetone	ug/L	<8.8	100	100	169	155	169	155	51-140	9	30	M1	
Acrolein	ug/L	<4.8	200	200	218	197	109	98	48-150	10	30		
Acrylonitrile	ug/L	<4.9	200	200	197	170	99	85	55-134	15	30		
Benzene	ug/L	<0.13	20	20	21.1	18.6	105	93	63-132	12	30		
Bromobenzene	ug/L	<0.16	20	20	20.6	19.3	103	97	67-138	6	30		
Bromochloromethane	ug/L	<0.38	20	20	21.0	18.1	105	91	66-138	15	30		
Bromodichloromethane	ug/L	<0.20	20	20	19.8	18.0	99	90	75-137	10	30		
Bromoform	ug/L	<1.0	20	20	22.0	19.2	110	96	65-129	14	30		
Bromomethane	ug/L	<1.5	20	20	35.2	33.4	176	167	41-150	5	30	M1	
Carbon disulfide	ug/L	<0.37	20	20	18.8	16.2	94	81	72-132	15	30		
Carbon tetrachloride	ug/L	<0.20	20	20	21.6	18.8	108	94	75-150	14	30		
Chlorobenzene	ug/L	<0.14	20	20	19.9	18.4	100	92	73-127	8	30		
Chloroethane	ug/L	<0.44	20	20	19.7	17.6	98	88	74-138	11	30		
Chloroform	ug/L	<0.46	20	20	20.6	18.1	103	90	74-125	13	30		
Chloromethane	ug/L	<1.1	20	20	27.1	36.7	136	183	58-129	30	30	M1	
cis-1,2-Dichloroethene	ug/L	0.69	20	20	21.7	19.7	105	95	63-135	10	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	21.9	18.8	109	94	66-129	15	30		
Dibromochloromethane	ug/L	<0.13	20	20	20.4	18.3	102	91	75-133	11	30		

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

Parameter	Units	2809668		2809669		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10416484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Dibromomethane	ug/L	<0.50	20	20	20.8	18.9	104	95	68-134	10	30		
Dichlorodifluoromethane	ug/L	<0.31	20	20	25.8	22.6	129	113	72-150	13	30		
Dichlorofluoromethane	ug/L	<0.38	20	20	21.7	19.0	108	95	75-129	13	30		
Diisopropyl ether	ug/L	<0.12	20	20	20.8	18.9	104	95	62-128	9	30		
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	21.3	19.1	106	96	63-132	11	30		
Ethylbenzene	ug/L	<0.14	20	20	20.5	19.2	103	96	72-130	7	30		
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	26.2	22.6	131	113	71-150	15	30		
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	19.9	18.4	100	92	70-136	8	30		
m&p-Xylene	ug/L	<0.24	40	40	42.1	38.7	105	97	64-142	9	30		
Methyl-tert-butyl ether	ug/L	<0.14	20	20	21.2	19.0	106	95	72-125	11	30		
Methylene Chloride	ug/L	<1.2	20	20	20.0	17.8	100	89	60-132	11	30		
n-Butylbenzene	ug/L	<0.13	20	20	21.5	19.1	108	96	60-150	12	30		
n-Propylbenzene	ug/L	<0.12	20	20	20.5	19.0	103	95	63-142	8	30		
Naphthalene	ug/L	<0.42	20	20	18.6	18.0	93	90	67-125	3	30		
o-Xylene	ug/L	<0.11	20	20	19.9	18.4	100	92	60-143	8	30		
p-Isopropyltoluene	ug/L	<0.14	20	20	22.3	20.4	111	102	64-146	9	30		
sec-Butylbenzene	ug/L	<0.12	20	20	22.2	20.0	111	100	67-144	11	30		
Styrene	ug/L	<0.14	20	20	21.9	19.9	109	99	67-136	9	30		
tert-Amylmethyl ether	ug/L	<0.12	20	20	20.7	18.5	104	93	60-134	11	30		
tert-Butyl Alcohol	ug/L	<2.2	200	200	231	195	116	98	56-146	17	30		
tert-Butylbenzene	ug/L	<0.15	20	20	21.2	19.1	106	96	68-135	10	30		
Tetrachloroethene	ug/L	<0.16	20	20	21.5	20.0	107	100	67-148	7	30		
Tetrahydrofuran	ug/L	<4.3	200	200	336	314	168	157	51-141	7	30	M1	
Toluene	ug/L	<0.17	20	20	20.4	17.8	102	89	61-140	14	30		
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	20.3	18.2	102	91	62-138	11	30		
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	20.3	17.4	102	87	67-134	16	30		
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	49.4	43.4	99	87	30-150	13	30		
Trichloroethene	ug/L	10.2	20	20	32.9	30.4	114	101	64-149	8	30		
Trichlorofluoromethane	ug/L	<0.13	20	20	24.0	21.2	120	106	75-150	12	30		
Vinyl acetate	ug/L	<1.5	20	20	19.9	18.0	99	90	49-143	10	30		
Vinyl chloride	ug/L	<0.096	20	20	23.7	20.8	118	104	75-133	13	30		
Xylene (Total)	ug/L	<0.24	60	60	62.1	57.0	103	95	63-142	8	30		
1,2-Dichloroethane-d4 (S)	%						96	96	75-137				
4-Bromofluorobenzene (S)	%						100	98	75-125				
Toluene-d8 (S)	%						98	96	75-125				

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416300

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10416300001	STARK-GW-010418	EPA 8260B	516886		
10416300002	ATWOODS-GW-010418	EPA 8260B	516886		
10416300003	ATWOODH-GW-010418	EPA 8260B	516886		

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Sample Condition Upon Receipt - ESI Tech Specs  
 Client Name: CH2M HILL  
 Project #: \_\_\_\_\_

**WO# : 10416300**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7475 9636 4408  
 Custody Seal on Cooler/Box Present?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_  
 Thermometer Used:  151401163  G87A9155100842  
 Type of Ice:  Wet  Blue  None  Dry  Melted  
 Cooler Temp Read (°C): 0.4 Cooler Temp Corrected (°C): 0.6 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 1.02 Date and Initials of Person Examining Contents: ME 1/5/18  
 USDA Regulated Soil ( N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

			COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7.
Sufficient Volume (triple volume provided for MS/MSD)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact?	<input type="checkbox"/> Yes <input type="checkbox"/> No		10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		12.
-Includes Date/Time/ID/Analysis Matrix: <u>wt</u>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH	13. Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		Sample #
Per method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		14.
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Field Data Required?  Yes  No

Comments/Resolution: \_\_\_\_\_

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1025</u>	Temp: <u>0.4</u>	Corrected Temp: <u>0.6</u>
Time: <u>1032</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review: \_\_\_\_\_  
 Note: Whenever there is a discrepancy affecting North Carolina compliance hold, incorrect preservative, out of temp, incorrect containers)  
 Date: 01/05/18  
 m will be sent to the North Carolina DEHNR Certification Office (i.e. out of



January 18, 2018

David Hodson  
CH2M Hill  
9451 Atkinson St  
Suite 100  
Roseville, CA 95747

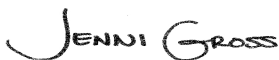
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416448

Dear David Hodson:

Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
Steve Demus, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

---

### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792

Montana Certificate #CERT0103

California Certification #2973

California Certification #2973

Alaska Certification UST-107

Alaska Certification UST-107

Alaska Certification #MN01084

Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445

North Dakota Certification: # R-203

Wisconsin DNR Certification #: 998027470

WA Department of Ecology Lab ID# C1007

Nevada DNR #MN010842018-1

Oklahoma Department of Environmental Quality

California Certification #2973

### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch:  
11277CA

Florida Department of Health (NELAC): E87595

Illinois Environmental Protection Agency: 0025721

Kansas Department of Health and Environment (NELAC):

E-10266

Louisiana Dept. of Environmental Quality (NELAC/LELAP):  
02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202

Texas Commission on Env. Quality (NELAC):

T104704405-09-TX

U.S. Dept. of Agriculture Foreign Soil Import: P330-10-  
00119

Commonwealth of Virginia (TNI): 480246

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10416448001	Thorson-GW-010518	Water	01/05/18 10:00	01/06/18 09:30
10416448002	Asher-GW-010518	Water	01/05/18 11:30	01/06/18 09:30
10416448003	Silva-GW-010518	Water	01/05/18 13:00	01/06/18 09:30
10416448004	Lang-GW-010518	Water	01/05/18 14:00	01/06/18 09:30
10416448005	Stark-GW-010518	Water	01/05/18 09:20	01/06/18 09:30
10416448006	AtwoodS-GW-010518	Water	01/05/18 11:00	01/06/18 09:30
10416448007	AtwoodH-GW-010518	Water	01/05/18 11:10	01/06/18 09:30
10416448008	FD03	Water	01/05/18 15:00	01/06/18 09:30
10416448009	FD04	Water	01/05/18 15:10	01/06/18 09:30
10416448010	FD05	Water	01/05/18 15:20	01/06/18 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10416448001	Thorson-GW-010518	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416448002	Asher-GW-010518	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416448003	Silva-GW-010518	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416448004	Lang-GW-010518	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416448005	Stark-GW-010518	6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
10416448006	AtwoodS-GW-010518	6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
10416448007	AtwoodH-GW-010518	6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
10416448008	FD03	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416448009	FD04	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V
10416448010	FD05	RSK 175	MJL	3	PASI-M
		6010C Met	DM	22	PASI-M
		EPA 7470A	LMW	1	PASI-M
		SM 2320B	JFP	1	PASI-M
		SM 2540C	NAS	1	PASI-M
		SM 4500-S-2 D	MCT	1	PASI-N
		EPA 300.0	KEO	3	PASI-M
		EPA 353.2	JFP	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 410.4	DCL	1	PASI-M
		SM 5310C	CRE	1	PASI-V

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10416448001</b>	<b>Thorson-GW-010518</b>					
RSK 175	Methane	4.0J	ug/L	10.0	01/12/18 11:55	
6010C Met	Barium, Dissolved	50.9	ug/L	10.0	01/10/18 16:06	
6010C Met	Calcium, Dissolved	23000	ug/L	500	01/10/18 16:06	
6010C Met	Copper, Dissolved	0.83J	ug/L	10.0	01/10/18 16:06	
6010C Met	Iron, Dissolved	2570	ug/L	50.0	01/10/18 16:06	
6010C Met	Magnesium, Dissolved	11600	ug/L	500	01/10/18 16:06	
6010C Met	Manganese, Dissolved	33.1	ug/L	5.0	01/10/18 16:06	
6010C Met	Potassium, Dissolved	3760	ug/L	2500	01/10/18 16:06	
6010C Met	Sodium, Dissolved	13800	ug/L	1000	01/10/18 16:06	
6010C Met	Thallium, Dissolved	6.3J	ug/L	20.0	01/10/18 16:06	
6010C Met	Vanadium, Dissolved	0.66J	ug/L	15.0	01/10/18 16:06	
6010C Met	Zinc, Dissolved	54.4	ug/L	20.0	01/10/18 16:06	
SM 2320B	Alkalinity, Total as CaCO3	143	mg/L	5.0	01/10/18 08:28	
SM 2540C	Total Dissolved Solids	200	mg/L	10.0	01/09/18 11:01	
EPA 300.0	Chloride	1.2	mg/L	1.2	01/06/18 21:47	
EPA 300.0	Sulfate	2.2	mg/L	1.2	01/06/18 21:47	
<b>10416448002</b>	<b>Asher-GW-010518</b>					
RSK 175	Methane	8.7J	ug/L	10.0	01/08/18 11:02	
6010C Met	Barium, Dissolved	69.1	ug/L	10.0	01/10/18 16:25	
6010C Met	Calcium, Dissolved	57300	ug/L	500	01/10/18 16:25	
6010C Met	Copper, Dissolved	62.9	ug/L	10.0	01/10/18 16:25	
6010C Met	Magnesium, Dissolved	16900	ug/L	500	01/10/18 16:25	
6010C Met	Potassium, Dissolved	1150J	ug/L	2500	01/10/18 16:25	
6010C Met	Sodium, Dissolved	18500	ug/L	1000	01/10/18 16:25	
6010C Met	Thallium, Dissolved	9.4J	ug/L	20.0	01/10/18 16:25	
6010C Met	Vanadium, Dissolved	9.6J	ug/L	15.0	01/10/18 16:25	
6010C Met	Zinc, Dissolved	38.2	ug/L	20.0	01/10/18 16:25	
SM 2320B	Alkalinity, Total as CaCO3	220	mg/L	5.0	01/10/18 08:59	
SM 2540C	Total Dissolved Solids	359	mg/L	10.0	01/09/18 11:01	
EPA 300.0	Chloride	7.3	mg/L	1.2	01/06/18 22:50	
EPA 300.0	Nitrate as N	7.1	mg/L	0.10	01/06/18 22:50	
EPA 353.2	Nitrogen, NO2 plus NO3	7.4	mg/L	0.20	01/11/18 11:33	
SM 5310C	Total Organic Carbon	0.84J	mg/L	1.0	01/10/18 17:31	
<b>10416448003</b>	<b>Silva-GW-010518</b>					
RSK 175	Methane	7.3J	ug/L	10.0	01/08/18 11:10	
6010C Met	Aluminum, Dissolved	11.1J	ug/L	200	01/10/18 16:29	
6010C Met	Barium, Dissolved	29.2	ug/L	10.0	01/10/18 16:29	
6010C Met	Calcium, Dissolved	38300	ug/L	500	01/10/18 16:29	
6010C Met	Copper, Dissolved	8.5J	ug/L	10.0	01/10/18 16:29	
6010C Met	Magnesium, Dissolved	12700	ug/L	500	01/10/18 16:29	
6010C Met	Potassium, Dissolved	1520J	ug/L	2500	01/10/18 16:29	
6010C Met	Sodium, Dissolved	14300	ug/L	1000	01/10/18 16:29	
6010C Met	Thallium, Dissolved	5.1J	ug/L	20.0	01/10/18 16:29	
6010C Met	Vanadium, Dissolved	9.1J	ug/L	15.0	01/10/18 16:29	
6010C Met	Zinc, Dissolved	3.0J	ug/L	20.0	01/10/18 16:29	
SM 2320B	Alkalinity, Total as CaCO3	162	mg/L	5.0	01/10/18 09:04	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
<b>10416448003</b>	<b>Silva-GW-010518</b>					
SM 2540C	Total Dissolved Solids	238	mg/L	10.0	01/09/18 11:01	
EPA 300.0	Chloride	2.3	mg/L	1.2	01/06/18 23:06	
EPA 300.0	Nitrate as N	2.3	mg/L	0.10	01/06/18 23:06	
EPA 353.2	Nitrogen, NO2 plus NO3	2.2	mg/L	0.040	01/11/18 11:35	
SM 5310C	Total Organic Carbon	0.42J	mg/L	1.0	01/10/18 17:44	
<b>10416448004</b>	<b>Lang-GW-010518</b>					
RSK 175	Methane	4.2J	ug/L	10.0	01/08/18 11:17	
6010C Met	Barium, Dissolved	16.1	ug/L	10.0	01/10/18 16:33	
6010C Met	Calcium, Dissolved	40600	ug/L	500	01/10/18 16:33	
6010C Met	Copper, Dissolved	8.5J	ug/L	10.0	01/10/18 16:33	
6010C Met	Iron, Dissolved	20.8J	ug/L	50.0	01/10/18 16:33	
6010C Met	Magnesium, Dissolved	11700	ug/L	500	01/10/18 16:33	
6010C Met	Manganese, Dissolved	10.5	ug/L	5.0	01/10/18 16:33	
6010C Met	Potassium, Dissolved	1150J	ug/L	2500	01/10/18 16:33	
6010C Met	Sodium, Dissolved	16500	ug/L	1000	01/10/18 16:33	
6010C Met	Vanadium, Dissolved	5.0J	ug/L	15.0	01/10/18 16:33	
6010C Met	Zinc, Dissolved	55.0	ug/L	20.0	01/10/18 16:33	
SM 2320B	Alkalinity, Total as CaCO3	195	mg/L	5.0	01/10/18 09:07	
SM 2540C	Total Dissolved Solids	238	mg/L	10.0	01/10/18 10:42	
EPA 300.0	Chloride	7.3	mg/L	1.2	01/06/18 23:21	
EPA 300.0	Nitrate as N	7.1	mg/L	0.10	01/06/18 23:21	
EPA 353.2	Nitrogen, NO2 plus NO3	0.47	mg/L	0.020	01/11/18 11:12	
<b>10416448005</b>	<b>Stark-GW-010518</b>					
6010C Met	Barium, Dissolved	34.2	ug/L	10.0	01/10/18 16:45	
6010C Met	Calcium, Dissolved	31000	ug/L	500	01/10/18 16:45	
6010C Met	Copper, Dissolved	263	ug/L	10.0	01/10/18 16:45	
6010C Met	Magnesium, Dissolved	11000	ug/L	500	01/10/18 16:45	
6010C Met	Manganese, Dissolved	0.39J	ug/L	5.0	01/10/18 16:45	
6010C Met	Potassium, Dissolved	1690J	ug/L	2500	01/10/18 16:45	
6010C Met	Sodium, Dissolved	16800	ug/L	1000	01/10/18 16:45	
6010C Met	Thallium, Dissolved	5.8J	ug/L	20.0	01/10/18 16:45	
6010C Met	Vanadium, Dissolved	6.1J	ug/L	15.0	01/10/18 16:45	
6010C Met	Zinc, Dissolved	75.7	ug/L	20.0	01/10/18 16:45	
<b>10416448006</b>	<b>AtwoodS-GW-010518</b>					
6010C Met	Barium, Dissolved	26.6	ug/L	10.0	01/10/18 16:49	
6010C Met	Calcium, Dissolved	31800	ug/L	500	01/10/18 16:49	
6010C Met	Copper, Dissolved	1120	ug/L	10.0	01/10/18 16:49	
6010C Met	Magnesium, Dissolved	10600	ug/L	500	01/10/18 16:49	
6010C Met	Manganese, Dissolved	3.1J	ug/L	5.0	01/10/18 16:49	
6010C Met	Nickel, Dissolved	2.8J	ug/L	20.0	01/10/18 16:49	
6010C Met	Potassium, Dissolved	1240J	ug/L	2500	01/10/18 16:49	
6010C Met	Sodium, Dissolved	12000	ug/L	1000	01/10/18 16:49	
6010C Met	Thallium, Dissolved	6.0J	ug/L	20.0	01/10/18 16:49	
6010C Met	Vanadium, Dissolved	6.1J	ug/L	15.0	01/10/18 16:49	
6010C Met	Zinc, Dissolved	2080	ug/L	20.0	01/10/18 16:49	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10416448007</b>	<b>AtwoodH-GW-010518</b>					
6010C Met	Barium, Dissolved	34.2	ug/L	10.0	01/10/18 16:53	
6010C Met	Calcium, Dissolved	25800	ug/L	500	01/10/18 16:53	
6010C Met	Copper, Dissolved	35.7	ug/L	10.0	01/10/18 16:53	
6010C Met	Magnesium, Dissolved	11100	ug/L	500	01/10/18 16:53	
6010C Met	Manganese, Dissolved	5.5	ug/L	5.0	01/10/18 16:53	
6010C Met	Nickel, Dissolved	3.6J	ug/L	20.0	01/10/18 16:53	
6010C Met	Potassium, Dissolved	3130	ug/L	2500	01/10/18 16:53	
6010C Met	Sodium, Dissolved	13700	ug/L	1000	01/10/18 16:53	
6010C Met	Vanadium, Dissolved	3.8J	ug/L	15.0	01/10/18 16:53	
6010C Met	Zinc, Dissolved	113	ug/L	20.0	01/10/18 16:53	
<b>10416448008</b>	<b>FD03</b>					
RSK 175	Methane	1.9J	ug/L	10.0	01/12/18 12:16	
6010C Met	Barium, Dissolved	70.5	ug/L	10.0	01/10/18 16:56	
6010C Met	Calcium, Dissolved	58500	ug/L	500	01/10/18 16:56	
6010C Met	Chromium, Dissolved	0.87J	ug/L	10.0	01/10/18 16:56	
6010C Met	Copper, Dissolved	61.0	ug/L	10.0	01/10/18 16:56	
6010C Met	Magnesium, Dissolved	17300	ug/L	500	01/10/18 16:56	
6010C Met	Potassium, Dissolved	1160J	ug/L	2500	01/10/18 16:56	
6010C Met	Sodium, Dissolved	18800	ug/L	1000	01/10/18 16:56	
6010C Met	Thallium, Dissolved	7.2J	ug/L	20.0	01/10/18 16:56	
6010C Met	Vanadium, Dissolved	9.7J	ug/L	15.0	01/10/18 16:56	
6010C Met	Zinc, Dissolved	32.4	ug/L	20.0	01/10/18 16:56	
SM 2320B	Alkalinity, Total as CaCO3	224	mg/L	5.0	01/10/18 09:11	
SM 2540C	Total Dissolved Solids	353	mg/L	10.0	01/10/18 10:42	
EPA 300.0	Chloride	1.8	mg/L	1.2	01/06/18 23:36	
EPA 300.0	Nitrate as N	0.42	mg/L	0.10	01/06/18 23:36	
EPA 353.2	Nitrogen, NO2 plus NO3	5.9	mg/L	0.10	01/11/18 11:45	
SM 5310C	Total Organic Carbon	0.92J	mg/L	1.0	01/10/18 18:10	
<b>10416448009</b>	<b>FD04</b>					
RSK 175	Methane	2.7J	ug/L	10.0	01/12/18 12:23	
6010C Met	Barium, Dissolved	29.3	ug/L	10.0	01/10/18 17:00	
6010C Met	Calcium, Dissolved	38400	ug/L	500	01/10/18 17:00	
6010C Met	Copper, Dissolved	8.6J	ug/L	10.0	01/10/18 17:00	
6010C Met	Magnesium, Dissolved	12800	ug/L	500	01/10/18 17:00	
6010C Met	Potassium, Dissolved	1500J	ug/L	2500	01/10/18 17:00	
6010C Met	Sodium, Dissolved	14300	ug/L	1000	01/10/18 17:00	
6010C Met	Thallium, Dissolved	4.9J	ug/L	20.0	01/10/18 17:00	
6010C Met	Vanadium, Dissolved	9.0J	ug/L	15.0	01/10/18 17:00	
6010C Met	Zinc, Dissolved	4.8J	ug/L	20.0	01/10/18 17:00	
SM 2320B	Alkalinity, Total as CaCO3	175	mg/L	5.0	01/10/18 09:15	
SM 2540C	Total Dissolved Solids	245	mg/L	10.0	01/10/18 10:42	
EPA 300.0	Chloride	2.3	mg/L	1.2	01/06/18 23:51	
EPA 300.0	Nitrate as N	2.3	mg/L	0.10	01/06/18 23:51	
EPA 353.2	Nitrogen, NO2 plus NO3	1.5	mg/L	0.040	01/11/18 11:39	
SM 5310C	Total Organic Carbon	0.47J	mg/L	1.0	01/11/18 10:45	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10416448010</b>	<b>FD05</b>					
RSK 175	Methane	2.9J	ug/L	10.0	01/12/18 12:31	
6010C Met	Aluminum, Dissolved	10.4J	ug/L	200	01/10/18 17:04	
6010C Met	Barium, Dissolved	16.1	ug/L	10.0	01/10/18 17:04	
6010C Met	Calcium, Dissolved	40600	ug/L	500	01/10/18 17:04	
6010C Met	Copper, Dissolved	6.5J	ug/L	10.0	01/10/18 17:04	
6010C Met	Iron, Dissolved	40.8J	ug/L	50.0	01/10/18 17:04	
6010C Met	Magnesium, Dissolved	11700	ug/L	500	01/10/18 17:04	
6010C Met	Manganese, Dissolved	10.6	ug/L	5.0	01/10/18 17:04	
6010C Met	Potassium, Dissolved	1110J	ug/L	2500	01/10/18 17:04	
6010C Met	Sodium, Dissolved	16500	ug/L	1000	01/10/18 17:04	
6010C Met	Vanadium, Dissolved	5.1J	ug/L	15.0	01/10/18 17:04	
6010C Met	Zinc, Dissolved	37.0	ug/L	20.0	01/10/18 17:04	
SM 2320B	Alkalinity, Total as CaCO <sub>3</sub>	191	mg/L	5.0	01/10/18 09:20	
SM 2540C	Total Dissolved Solids	237	mg/L	10.0	01/10/18 10:42	
EPA 353.2	Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	0.47	mg/L	0.020	01/11/18 11:15	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

10 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

10 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 18, 2018

**General Information:**

7 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

**Sample: Thorson-GW-010518**      **Lab ID: 10416448001**      Collected: 01/05/18 10:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/12/18 11:55	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/12/18 11:55	74-85-1	
Methane	4.0J	ug/L	10.0	1.1	1		01/12/18 11:55	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:06	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:06	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:06	7440-38-2	
Barium, Dissolved	50.9	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:06	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:06	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:06	7440-43-9	
Calcium, Dissolved	23000	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:06	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:06	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:06	7440-48-4	
Copper, Dissolved	0.83J	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:06	7440-50-8	
Iron, Dissolved	2570	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:06	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:06	7439-92-1	
Magnesium, Dissolved	11600	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:06	7439-95-4	
Manganese, Dissolved	33.1	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:06	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:06	7440-02-0	
Potassium, Dissolved	3760	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:06	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:06	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:06	7440-22-4	
Sodium, Dissolved	13800	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:06	7440-23-5	
Thallium, Dissolved	6.3J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:06	7440-28-0	
Vanadium, Dissolved	0.66J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:06	7440-62-2	
Zinc, Dissolved	54.4	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:06	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 14:53	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	143	mg/L	5.0	1.4	1		01/10/18 08:28		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	200	mg/L	10.0	5.0	1		01/09/18 11:01		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:55	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.2	mg/L	1.2	0.14	1		01/06/18 21:47	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		01/06/18 21:47	14797-55-8	
Sulfate	2.2	mg/L	1.2	0.27	1		01/06/18 21:47	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: Thorson-GW-010518**      **Lab ID: 10416448001**      Collected: 01/05/18 10:00      Received: 01/06/18 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>&lt;0.0075</b>	mg/L	0.020	0.0075	1		01/11/18 11:04		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:36		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		01/10/18 16:51	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

**Sample: Asher-GW-010518**      **Lab ID: 10416448002**      Collected: 01/05/18 11:30      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/08/18 11:02	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/08/18 11:02	74-85-1	
Methane	8.7J	ug/L	10.0	1.1	1		01/08/18 11:02	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:25	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:25	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:25	7440-38-2	
Barium, Dissolved	69.1	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:25	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:25	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:25	7440-43-9	
Calcium, Dissolved	57300	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:25	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:25	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:25	7440-48-4	
Copper, Dissolved	62.9	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:25	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:25	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:25	7439-92-1	
Magnesium, Dissolved	16900	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:25	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:25	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:25	7440-02-0	
Potassium, Dissolved	1150J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:25	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:25	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:25	7440-22-4	
Sodium, Dissolved	18500	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:25	7440-23-5	
Thallium, Dissolved	9.4J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:25	7440-28-0	
Vanadium, Dissolved	9.6J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:25	7440-62-2	
Zinc, Dissolved	38.2	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:25	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:00	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	220	mg/L	5.0	1.4	1		01/10/18 08:59		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	359	mg/L	10.0	5.0	1		01/09/18 11:01		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:57	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.3	mg/L	1.2	0.14	1		01/06/18 22:50	16887-00-6	
Nitrate as N	7.1	mg/L	0.10	0.0079	1		01/06/18 22:50	14797-55-8	
Sulfate	<0.27	mg/L	1.2	0.27	1		01/06/18 22:50	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: Asher-GW-010518**      **Lab ID: 10416448002**      Collected: 01/05/18 11:30      Received: 01/06/18 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>7.4</b>	mg/L	0.20	0.075	10		01/11/18 11:33		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:37		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.84J</b>	mg/L	1.0	0.20	1		01/10/18 17:31	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

**Sample: Silva-GW-010518**      **Lab ID: 10416448003**      Collected: 01/05/18 13:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b>		Analytical Method: RSK 175							
Ethane	<4.9	ug/L	10.0	4.9	1		01/08/18 11:10	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/08/18 11:10	74-85-1	
Methane	7.3J	ug/L	10.0	1.1	1		01/08/18 11:10	74-82-8	
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met      Preparation Method: EPA 3010							
Aluminum, Dissolved	11.1J	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:29	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:29	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:29	7440-38-2	
Barium, Dissolved	29.2	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:29	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:29	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:29	7440-43-9	
Calcium, Dissolved	38300	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:29	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:29	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:29	7440-48-4	
Copper, Dissolved	8.5J	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:29	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:29	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:29	7439-92-1	
Magnesium, Dissolved	12700	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:29	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:29	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:29	7440-02-0	
Potassium, Dissolved	1520J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:29	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:29	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:29	7440-22-4	
Sodium, Dissolved	14300	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:29	7440-23-5	
Thallium, Dissolved	5.1J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:29	7440-28-0	
Vanadium, Dissolved	9.1J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:29	7440-62-2	
Zinc, Dissolved	3.0J	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:29	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A      Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:02	7439-97-6	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	162	mg/L	5.0	1.4	1		01/10/18 09:04		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	238	mg/L	10.0	5.0	1		01/09/18 11:01		
<b>4500S2D Sulfide, Total</b>		Analytical Method: SM 4500-S-2 D							
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:58	18496-25-8	
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0							
Chloride	2.3	mg/L	1.2	0.14	1		01/06/18 23:06	16887-00-6	
Nitrate as N	2.3	mg/L	0.10	0.0079	1		01/06/18 23:06	14797-55-8	
Sulfate	<0.27	mg/L	1.2	0.27	1		01/06/18 23:06	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: Silva-GW-010518**      **Lab ID: 10416448003**      Collected: 01/05/18 13:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>2.2</b>	mg/L	0.040	0.015	2		01/11/18 11:35		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:37		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.42J</b>	mg/L	1.0	0.20	1		01/10/18 17:44	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

**Sample: Lang-GW-010518**      **Lab ID: 10416448004**      Collected: 01/05/18 14:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/08/18 11:17	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/08/18 11:17	74-85-1	
Methane	4.2J	ug/L	10.0	1.1	1		01/08/18 11:17	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:33	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:33	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:33	7440-38-2	
Barium, Dissolved	16.1	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:33	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:33	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:33	7440-43-9	
Calcium, Dissolved	40600	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:33	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:33	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:33	7440-48-4	
Copper, Dissolved	8.5J	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:33	7440-50-8	
Iron, Dissolved	20.8J	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:33	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:33	7439-92-1	
Magnesium, Dissolved	11700	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:33	7439-95-4	
Manganese, Dissolved	10.5	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:33	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:33	7440-02-0	
Potassium, Dissolved	1150J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:33	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:33	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:33	7440-22-4	
Sodium, Dissolved	16500	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:33	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:33	7440-28-0	
Vanadium, Dissolved	5.0J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:33	7440-62-2	
Zinc, Dissolved	55.0	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:33	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:04	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	195	mg/L	5.0	1.4	1		01/10/18 09:07		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	238	mg/L	10.0	5.0	1		01/10/18 10:42		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:59	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	7.3	mg/L	1.2	0.14	1		01/06/18 23:21	16887-00-6	
Nitrate as N	7.1	mg/L	0.10	0.0079	1		01/06/18 23:21	14797-55-8	
Sulfate	<0.27	mg/L	1.2	0.27	1		01/06/18 23:21	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: Lang-GW-010518**      **Lab ID: 10416448004**      Collected: 01/05/18 14:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.47</b>	mg/L	0.020	0.0075	1		01/11/18 11:12		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:37		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		01/10/18 17:57	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10416448

**Sample: Stark-GW-010518**      **Lab ID: 10416448005**      Collected: 01/05/18 09:20      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met    Preparation Method: EPA 3010							
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:45	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:45	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:45	7440-38-2	
Barium, Dissolved	34.2	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:45	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:45	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:45	7440-43-9	
Calcium, Dissolved	31000	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:45	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:45	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:45	7440-48-4	
Copper, Dissolved	263	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:45	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:45	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:45	7439-92-1	
Magnesium, Dissolved	11000	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:45	7439-95-4	
Manganese, Dissolved	0.39J	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:45	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:45	7440-02-0	
Potassium, Dissolved	1690J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:45	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:45	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:45	7440-22-4	
Sodium, Dissolved	16800	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:45	7440-23-5	
Thallium, Dissolved	5.8J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:45	7440-28-0	
Vanadium, Dissolved	6.1J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:45	7440-62-2	
Zinc, Dissolved	75.7	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:45	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A    Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:11	7439-97-6	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

**Sample: AtwoodS-GW-010518**      **Lab ID: 10416448006**      Collected: 01/05/18 11:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met    Preparation Method: EPA 3010							
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:49	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:49	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:49	7440-38-2	
Barium, Dissolved	26.6	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:49	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:49	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:49	7440-43-9	
Calcium, Dissolved	31800	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:49	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:49	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:49	7440-48-4	
Copper, Dissolved	1120	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:49	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:49	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:49	7439-92-1	
Magnesium, Dissolved	10600	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:49	7439-95-4	
Manganese, Dissolved	3.1J	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:49	7439-96-5	
Nickel, Dissolved	2.8J	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:49	7440-02-0	
Potassium, Dissolved	1240J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:49	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:49	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:49	7440-22-4	
Sodium, Dissolved	12000	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:49	7440-23-5	
Thallium, Dissolved	6.0J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:49	7440-28-0	
Vanadium, Dissolved	6.1J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:49	7440-62-2	
Zinc, Dissolved	2080	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:49	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A    Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:13	7439-97-6	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10416448

**Sample: AtwoodH-GW-010518**      **Lab ID: 10416448007**      Collected: 01/05/18 11:10      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010C MET ICP, Dissolved</b>		Analytical Method: 6010C Met    Preparation Method: EPA 3010							
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:53	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:53	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:53	7440-38-2	
Barium, Dissolved	34.2	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:53	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:53	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:53	7440-43-9	
Calcium, Dissolved	25800	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:53	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:53	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:53	7440-48-4	
Copper, Dissolved	35.7	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:53	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:53	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:53	7439-92-1	
Magnesium, Dissolved	11100	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:53	7439-95-4	
Manganese, Dissolved	5.5	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:53	7439-96-5	
Nickel, Dissolved	3.6J	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:53	7440-02-0	
Potassium, Dissolved	3130	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:53	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:53	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:53	7440-22-4	
Sodium, Dissolved	13700	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:53	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:53	7440-28-0	
Vanadium, Dissolved	3.8J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:53	7440-62-2	
Zinc, Dissolved	113	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:53	7440-66-6	
<b>7470A Mercury, Dissolved</b>		Analytical Method: EPA 7470A    Preparation Method: EPA 7470A							
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:16	7439-97-6	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Page Project No.: 10416448

**Sample: FD03**      **Lab ID: 10416448008**      Collected: 01/05/18 15:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/12/18 12:16	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/12/18 12:16	74-85-1	
Methane	1.9J	ug/L	10.0	1.1	1		01/12/18 12:16	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 16:56	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 16:56	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 16:56	7440-38-2	
Barium, Dissolved	70.5	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 16:56	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 16:56	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 16:56	7440-43-9	
Calcium, Dissolved	58500	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 16:56	7440-70-2	
Chromium, Dissolved	0.87J	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 16:56	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 16:56	7440-48-4	
Copper, Dissolved	61.0	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 16:56	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 16:56	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 16:56	7439-92-1	
Magnesium, Dissolved	17300	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 16:56	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 16:56	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 16:56	7440-02-0	
Potassium, Dissolved	1160J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 16:56	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 16:56	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 16:56	7440-22-4	
Sodium, Dissolved	18800	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 16:56	7440-23-5	
Thallium, Dissolved	7.2J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 16:56	7440-28-0	
Vanadium, Dissolved	9.7J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 16:56	7440-62-2	
Zinc, Dissolved	32.4	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 16:56	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:18	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	224	mg/L	5.0	1.4	1		01/10/18 09:11		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	353	mg/L	10.0	5.0	1		01/10/18 10:42		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:59	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.8	mg/L	1.2	0.14	1		01/06/18 23:36	16887-00-6	
Nitrate as N	0.42	mg/L	0.10	0.0079	1		01/06/18 23:36	14797-55-8	
Sulfate	<0.27	mg/L	1.2	0.27	1		01/06/18 23:36	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: FD03**      **Lab ID: 10416448008**      Collected: 01/05/18 15:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>									
Analytical Method: EPA 353.2									
Nitrogen, NO2 plus NO3	<b>5.9</b>	mg/L	0.10	0.037	5		01/11/18 11:45		
<b>410.4 COD</b>									
Analytical Method: EPA 410.4      Preparation Method: EPA 410.4									
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:37		
<b>5310C TOC</b>									
Analytical Method: SM 5310C									
Total Organic Carbon	<b>0.92J</b>	mg/L	1.0	0.20	1		01/10/18 18:10	7440-44-0	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Page Project No.: 10416448

**Sample: FD04**      **Lab ID: 10416448009**      Collected: 01/05/18 15:10      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/12/18 12:23	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/12/18 12:23	74-85-1	
Methane	2.7J	ug/L	10.0	1.1	1		01/12/18 12:23	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 17:00	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 17:00	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 17:00	7440-38-2	
Barium, Dissolved	29.3	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 17:00	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 17:00	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 17:00	7440-43-9	
Calcium, Dissolved	38400	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 17:00	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 17:00	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 17:00	7440-48-4	
Copper, Dissolved	8.6J	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 17:00	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 17:00	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 17:00	7439-92-1	
Magnesium, Dissolved	12800	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 17:00	7439-95-4	
Manganese, Dissolved	<0.38	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 17:00	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 17:00	7440-02-0	
Potassium, Dissolved	1500J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 17:00	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 17:00	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 17:00	7440-22-4	
Sodium, Dissolved	14300	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 17:00	7440-23-5	
Thallium, Dissolved	4.9J	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 17:00	7440-28-0	
Vanadium, Dissolved	9.0J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 17:00	7440-62-2	
Zinc, Dissolved	4.8J	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 17:00	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:20	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	175	mg/L	5.0	1.4	1		01/10/18 09:15		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	245	mg/L	10.0	5.0	1		01/10/18 10:42		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2-D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:59	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	2.3	mg/L	1.2	0.14	1		01/06/18 23:51	16887-00-6	
Nitrate as N	2.3	mg/L	0.10	0.0079	1		01/06/18 23:51	14797-55-8	
Sulfate	<0.27	mg/L	1.2	0.27	1		01/06/18 23:51	14808-79-8	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: FD04**      **Lab ID: 10416448009**      Collected: 01/05/18 15:10      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>1.5</b>	mg/L	0.040	0.015	2		01/11/18 11:39		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:37		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.47J</b>	mg/L	1.0	0.20	1		01/11/18 10:45	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Page Project No.: 10416448

**Sample: FD05**      **Lab ID: 10416448010**      Collected: 01/05/18 15:20      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/12/18 12:31	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/12/18 12:31	74-85-1	
Methane	2.9J	ug/L	10.0	1.1	1		01/12/18 12:31	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	10.4J	ug/L	200	8.6	1	01/09/18 10:18	01/10/18 17:04	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/09/18 10:18	01/10/18 17:04	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/09/18 10:18	01/10/18 17:04	7440-38-2	
Barium, Dissolved	16.1	ug/L	10.0	0.22	1	01/09/18 10:18	01/10/18 17:04	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/09/18 10:18	01/10/18 17:04	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/09/18 10:18	01/10/18 17:04	7440-43-9	
Calcium, Dissolved	40600	ug/L	500	24.7	1	01/09/18 10:18	01/10/18 17:04	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/09/18 10:18	01/10/18 17:04	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/09/18 10:18	01/10/18 17:04	7440-48-4	
Copper, Dissolved	6.5J	ug/L	10.0	0.83	1	01/09/18 10:18	01/10/18 17:04	7440-50-8	
Iron, Dissolved	40.8J	ug/L	50.0	16.7	1	01/09/18 10:18	01/10/18 17:04	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/09/18 10:18	01/10/18 17:04	7439-92-1	
Magnesium, Dissolved	11700	ug/L	500	2.6	1	01/09/18 10:18	01/10/18 17:04	7439-95-4	
Manganese, Dissolved	10.6	ug/L	5.0	0.38	1	01/09/18 10:18	01/10/18 17:04	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/09/18 10:18	01/10/18 17:04	7440-02-0	
Potassium, Dissolved	1110J	ug/L	2500	126	1	01/09/18 10:18	01/10/18 17:04	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/09/18 10:18	01/10/18 17:04	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/09/18 10:18	01/10/18 17:04	7440-22-4	
Sodium, Dissolved	16500	ug/L	1000	44.6	1	01/09/18 10:18	01/10/18 17:04	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	01/09/18 10:18	01/10/18 17:04	7440-28-0	
Vanadium, Dissolved	5.1J	ug/L	15.0	0.42	1	01/09/18 10:18	01/10/18 17:04	7440-62-2	
Zinc, Dissolved	37.0	ug/L	20.0	1.8	1	01/09/18 10:18	01/10/18 17:04	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/09/18 12:29	01/09/18 15:22	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	191	mg/L	5.0	1.4	1		01/10/18 09:20		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	237	mg/L	10.0	5.0	1		01/10/18 10:42		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/10/18 11:59	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	<0.14	mg/L	1.2	0.14	1		01/07/18 00:36	16887-00-6	
Nitrate as N	<0.0079	mg/L	0.10	0.0079	1		01/07/18 00:36	14797-55-8	
Sulfate	<0.27	mg/L	1.2	0.27	1		01/07/18 00:36	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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**Sample: FD05**      **Lab ID: 10416448010**      Collected: 01/05/18 15:20      Received: 01/06/18 09:30      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>0.47</b>	mg/L	0.020	0.0075	1		01/11/18 11:15		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/10/18 09:22	01/10/18 13:38		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>&lt;0.20</b>	mg/L	1.0	0.20	1		01/11/18 10:58	7440-44-0	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 517857 Analysis Method: RSK 175  
 QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
 Associated Lab Samples: 10416448001, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2813218 Matrix: Water  
 Associated Lab Samples: 10416448001, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	01/12/18 11:47	
Ethene	ug/L	<0.68	10.0	0.68	01/12/18 11:47	
Methane	ug/L	3.3J	10.0	1.1	01/12/18 11:47	

LABORATORY CONTROL SAMPLE & LCSD: 2813219 2813220

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Ethane	ug/L	114	111	99.5	98	87	85-115	11	20	
Ethene	ug/L	106	104	94.5	98	89	85-115	9	20	
Methane	ug/L	60.7	59.9	57.6	99	95	85-115	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2813837 2813838

Parameter	Units	10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	101	32.7	88	28	30-150	102	20	M1,R1
Ethene	ug/L	<0.68	106	106	94.5	30.5	89	29	30-150	102	20	M1,R1
Methane	ug/L	4.0J	60.7	60.7	56.7	22.6	87	31	30-150	86	20	R1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 517206

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448005, 10416448006, 10416448007, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2810029

Matrix: Water

Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448005, 10416448006, 10416448007, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	01/09/18 14:48	

LABORATORY CONTROL SAMPLE: 2810030

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2810031 2810032

Parameter	Units	2810031		2810032		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury, Dissolved	ug/L	<0.062	5	5	5.0	4.8	100	96	80-120	4	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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QC Batch: 517202 Analysis Method: 6010C Met  
 QC Batch Method: EPA 3010 Analysis Description: 6010C Water Dissolved  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448005, 10416448006, 10416448007, 10416448008, 10416448009, 10416448010

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METHOD BLANK: 2810021 Matrix: Water  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448005, 10416448006, 10416448007, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	01/10/18 15:58	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	01/10/18 15:58	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	01/10/18 15:58	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	01/10/18 15:58	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	01/10/18 15:58	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	01/10/18 15:58	
Calcium, Dissolved	ug/L	<24.7	500	24.7	01/10/18 15:58	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	01/10/18 15:58	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	01/10/18 15:58	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	01/10/18 15:58	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	01/10/18 15:58	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	01/10/18 15:58	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	01/10/18 15:58	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	01/10/18 15:58	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	01/10/18 15:58	
Potassium, Dissolved	ug/L	<126	2500	126	01/10/18 15:58	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	01/10/18 15:58	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	01/10/18 15:58	
Sodium, Dissolved	ug/L	58.3J	1000	44.6	01/10/18 15:58	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	01/10/18 15:58	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	01/10/18 15:58	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	01/10/18 15:58	

LABORATORY CONTROL SAMPLE: 2810022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	19400	97	80-120	
Antimony, Dissolved	ug/L	1000	926	93	80-120	
Arsenic, Dissolved	ug/L	1000	900	90	80-120	
Barium, Dissolved	ug/L	1000	956	96	80-120	
Beryllium, Dissolved	ug/L	1000	951	95	80-120	
Cadmium, Dissolved	ug/L	1000	937	94	80-120	
Calcium, Dissolved	ug/L	20000	18500	92	80-120	
Chromium, Dissolved	ug/L	1000	943	94	80-120	
Cobalt, Dissolved	ug/L	1000	943	94	80-120	
Copper, Dissolved	ug/L	1000	924	92	80-120	
Iron, Dissolved	ug/L	20000	19000	95	80-120	
Lead, Dissolved	ug/L	1000	946	95	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

LABORATORY CONTROL SAMPLE: 2810022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Magnesium, Dissolved	ug/L	20000	18800	94	80-120	
Manganese, Dissolved	ug/L	1000	959	96	80-120	
Nickel, Dissolved	ug/L	1000	950	95	80-120	
Potassium, Dissolved	ug/L	20000	18900	95	80-120	
Selenium, Dissolved	ug/L	1000	960	96	80-120	
Silver, Dissolved	ug/L	500	463	93	80-120	
Sodium, Dissolved	ug/L	20000	18500	93	80-120	
Thallium, Dissolved	ug/L	1000	908	91	80-120	
Vanadium, Dissolved	ug/L	1000	922	92	80-120	
Zinc, Dissolved	ug/L	1000	940	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2810023 2810024

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10416448001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum, Dissolved	ug/L	<8.6	20000	20000	19900	19900	99	100	75-125	0	20
Antimony, Dissolved	ug/L	<3.1	1000	1000	960	952	96	95	75-125	1	20
Arsenic, Dissolved	ug/L	<5.2	1000	1000	921	919	92	92	75-125	0	20
Barium, Dissolved	ug/L	50.9	1000	1000	1020	1020	97	97	75-125	0	20
Beryllium, Dissolved	ug/L	<0.11	1000	1000	969	971	97	97	75-125	0	20
Cadmium, Dissolved	ug/L	<0.46	1000	1000	949	952	95	95	75-125	0	20
Calcium, Dissolved	ug/L	23000	20000	20000	42600	42500	98	98	75-125	0	20
Chromium, Dissolved	ug/L	<0.50	1000	1000	956	958	96	96	75-125	0	20
Cobalt, Dissolved	ug/L	<1.1	1000	1000	944	945	94	94	75-125	0	20
Copper, Dissolved	ug/L	0.83J	1000	1000	946	948	94	95	75-125	0	20
Iron, Dissolved	ug/L	2570	20000	20000	21900	21900	97	96	75-125	0	20
Lead, Dissolved	ug/L	<3.0	1000	1000	952	953	95	95	75-125	0	20
Magnesium, Dissolved	ug/L	11600	20000	20000	31200	31200	98	98	75-125	0	20
Manganese, Dissolved	ug/L	33.1	1000	1000	1000	1000	97	97	75-125	0	20
Nickel, Dissolved	ug/L	<1.1	1000	1000	950	951	95	95	75-125	0	20
Potassium, Dissolved	ug/L	3760	20000	20000	23800	23800	100	100	75-125	0	20
Selenium, Dissolved	ug/L	<6.4	1000	1000	955	957	96	96	75-125	0	20
Silver, Dissolved	ug/L	<0.27	500	500	472	473	94	95	75-125	0	20
Sodium, Dissolved	ug/L	13800	20000	20000	33100	33200	96	97	75-125	0	20
Thallium, Dissolved	ug/L	6.3J	1000	1000	920	930	91	92	75-125	1	20
Vanadium, Dissolved	ug/L	0.66J	1000	1000	938	939	94	94	75-125	0	20
Zinc, Dissolved	ug/L	54.4	1000	1000	993	992	94	94	75-125	0	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416448

QC Batch: 517392 Analysis Method: SM 2320B  
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity  
Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2811130 Matrix: Water  
Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	01/10/18 07:58	

LABORATORY CONTROL SAMPLE & LCSD: 2811131 2811132

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	40.5	40.9	101	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2811133 2811134

Parameter	Units	10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	143	40	40	185	182	105	98	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2811135 2811136

Parameter	Units	10416543002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	110	40	40	151	154	104	111	80-120	2	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 517210

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10416448001, 10416448002, 10416448003

METHOD BLANK: 2810040

Matrix: Water

Associated Lab Samples: 10416448001, 10416448002, 10416448003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	01/09/18 11:01	

LABORATORY CONTROL SAMPLE: 2810041

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	978	98	80-120	

SAMPLE DUPLICATE: 2810042

Parameter	Units	10416448001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	200	195	3	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 517436

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2811283

Matrix: Water

Associated Lab Samples: 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	01/10/18 10:42	

LABORATORY CONTROL SAMPLE: 2811284

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	970	97	80-120	

SAMPLE DUPLICATE: 2811285

Parameter	Units	10416594001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2230	2220	0	10	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 98787 Analysis Method: SM 4500-S-2 D  
 QC Batch Method: SM 4500-S-2 D Analysis Description: 4500S2D Sulfide, Total  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 425351 Matrix: Water  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.0050	0.020	0.0050	01/10/18 11:52	

LABORATORY CONTROL SAMPLE: 425352

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	.2	0.19	96	90-110	

MATRIX SPIKE SAMPLE: 425354

Parameter	Units	10416448001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	<0.0050	.2	0.20	102	75-125	

SAMPLE DUPLICATE: 425353

Parameter	Units	10416448001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.0050	<0.0050		20	

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**QUALITY CONTROL DATA**

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 516971 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2809206 Matrix: Water  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.14	1.2	0.14	01/06/18 21:09	
Nitrate as N	mg/L	<0.0079	0.10	0.0079	01/06/18 21:09	
Sulfate	mg/L	<0.27	1.2	0.27	01/06/18 21:09	

LABORATORY CONTROL SAMPLE: 2809207

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.4	99	90-110	
Nitrate as N	mg/L	1	0.94	94	90-110	
Sulfate	mg/L	12.5	12.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809208 2809209

Parameter	Units	2809208		2809209		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	1.2	12.5	12.5	13.0	94	94	90-110	1	20	
Nitrate as N	mg/L	<0.0079	1	1	0.91	91	92	90-110	1	20	
Sulfate	mg/L	2.2	12.5	12.5	14.1	95	96	90-110	1	20	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 517662 Analysis Method: EPA 353.2  
 QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2812360 Matrix: Water  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.0075	0.020	0.0075	01/11/18 11:29	

LABORATORY CONTROL SAMPLE: 2812361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2812362 2812363

Parameter	Units	10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	<0.0075	1	1	0.97	0.94	96	93	90-110	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2812364 2812365

Parameter	Units	10416798001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	0.98	0.94	98	94	90-110	5	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416448

QC Batch: 517041 Analysis Method: EPA 410.4  
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD  
Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 2809437 Matrix: Water  
Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	<15.8	50.0	15.8	01/10/18 13:31	

LABORATORY CONTROL SAMPLE: 2809438

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	300	310	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809439 2809440

Parameter	Units	10416375001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	1370	2500	2500	4050	4060	107	108	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809441 2809442

Parameter	Units	10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	<15.8	250	250	254	251	102	100	90-110	1	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

QC Batch: 134926 Analysis Method: SM 5310C  
 QC Batch Method: SM 5310C Analysis Description: 5310C TOC  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

METHOD BLANK: 537382 Matrix: Water  
 Associated Lab Samples: 10416448001, 10416448002, 10416448003, 10416448004, 10416448008, 10416448009, 10416448010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Organic Carbon	mg/L	<0.20	1.0	0.20	01/10/18 16:13	

LABORATORY CONTROL SAMPLE: 537383

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Organic Carbon	mg/L	25	24.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 537384 537385

Parameter	Units	10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	<0.20	25	25	25.1	25.2	100	100	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 537481 537482

Parameter	Units	10416448010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Total Organic Carbon	mg/L	<0.20	25	25	25.5	25.9	101	103	80-120	1	20	

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

PASI-N Pace Analytical Services - New Orleans

PASI-V Pace Analytical Services - Virginia

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416448

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10416448001	Thorson-GW-010518	RSK 175	517857		
10416448002	Asher-GW-010518	RSK 175	517038		
10416448003	Silva-GW-010518	RSK 175	517038		
10416448004	Lang-GW-010518	RSK 175	517038		
10416448008	FD03	RSK 175	517857		
10416448009	FD04	RSK 175	517857		
10416448010	FD05	RSK 175	517857		
10416448001	Thorson-GW-010518	EPA 3010	517202	6010C Met	517345
10416448002	Asher-GW-010518	EPA 3010	517202	6010C Met	517345
10416448003	Silva-GW-010518	EPA 3010	517202	6010C Met	517345
10416448004	Lang-GW-010518	EPA 3010	517202	6010C Met	517345
10416448005	Stark-GW-010518	EPA 3010	517202	6010C Met	517345
10416448006	AtwoodS-GW-010518	EPA 3010	517202	6010C Met	517345
10416448007	AtwoodH-GW-010518	EPA 3010	517202	6010C Met	517345
10416448008	FD03	EPA 3010	517202	6010C Met	517345
10416448009	FD04	EPA 3010	517202	6010C Met	517345
10416448010	FD05	EPA 3010	517202	6010C Met	517345
10416448001	Thorson-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448002	Asher-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448003	Silva-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448004	Lang-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448005	Stark-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448006	AtwoodS-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448007	AtwoodH-GW-010518	EPA 7470A	517206	EPA 7470A	517329
10416448008	FD03	EPA 7470A	517206	EPA 7470A	517329
10416448009	FD04	EPA 7470A	517206	EPA 7470A	517329
10416448010	FD05	EPA 7470A	517206	EPA 7470A	517329
10416448001	Thorson-GW-010518	SM 2320B	517392		
10416448002	Asher-GW-010518	SM 2320B	517392		
10416448003	Silva-GW-010518	SM 2320B	517392		
10416448004	Lang-GW-010518	SM 2320B	517392		
10416448008	FD03	SM 2320B	517392		
10416448009	FD04	SM 2320B	517392		
10416448010	FD05	SM 2320B	517392		
10416448001	Thorson-GW-010518	SM 2540C	517210		
10416448002	Asher-GW-010518	SM 2540C	517210		
10416448003	Silva-GW-010518	SM 2540C	517210		
10416448004	Lang-GW-010518	SM 2540C	517436		
10416448008	FD03	SM 2540C	517436		
10416448009	FD04	SM 2540C	517436		
10416448010	FD05	SM 2540C	517436		
10416448001	Thorson-GW-010518	SM 4500-S-2 D	98787		
10416448002	Asher-GW-010518	SM 4500-S-2 D	98787		
10416448003	Silva-GW-010518	SM 4500-S-2 D	98787		
10416448004	Lang-GW-010518	SM 4500-S-2 D	98787		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416448

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10416448008	FD03	SM 4500-S-2 D	98787		
10416448009	FD04	SM 4500-S-2 D	98787		
10416448010	FD05	SM 4500-S-2 D	98787		
10416448001	Thorson-GW-010518	EPA 300.0	516971		
10416448002	Asher-GW-010518	EPA 300.0	516971		
10416448003	Silva-GW-010518	EPA 300.0	516971		
10416448004	Lang-GW-010518	EPA 300.0	516971		
10416448008	FD03	EPA 300.0	516971		
10416448009	FD04	EPA 300.0	516971		
10416448010	FD05	EPA 300.0	516971		
10416448001	Thorson-GW-010518	EPA 353.2	517662		
10416448002	Asher-GW-010518	EPA 353.2	517662		
10416448003	Silva-GW-010518	EPA 353.2	517662		
10416448004	Lang-GW-010518	EPA 353.2	517662		
10416448008	FD03	EPA 353.2	517662		
10416448009	FD04	EPA 353.2	517662		
10416448010	FD05	EPA 353.2	517662		
10416448001	Thorson-GW-010518	EPA 410.4	517041	EPA 410.4	517519
10416448002	Asher-GW-010518	EPA 410.4	517041	EPA 410.4	517519
10416448003	Silva-GW-010518	EPA 410.4	517041	EPA 410.4	517519
10416448004	Lang-GW-010518	EPA 410.4	517041	EPA 410.4	517519
10416448008	FD03	EPA 410.4	517041	EPA 410.4	517519
10416448009	FD04	EPA 410.4	517041	EPA 410.4	517519
10416448010	FD05	EPA 410.4	517041	EPA 410.4	517519
10416448001	Thorson-GW-010518	SM 5310C	134926		
10416448002	Asher-GW-010518	SM 5310C	134926		
10416448003	Silva-GW-010518	SM 5310C	134926		
10416448004	Lang-GW-010518	SM 5310C	134926		
10416448008	FD03	SM 5310C	134926		
10416448009	FD04	SM 5310C	134926		
10416448010	FD05	SM 5310C	134926		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10416448

**Section A**

**Required Client Information:**

Company: CH2M Hill  
 Address: 999 W. Riverside Ave, Suite 500  
 Spokane, WA 99201  
 Email:  
 Phone: Fax:  
 Requested Due Date: **10 Day Standard**

**Section B**

**Required Project Information:**

Report To: Mark Ochsner, Brad Ostapkowicz  
 Copy To: Steve Demus, Lindsey Baumann  
 Copy To: David Hodson, UPRR-Sysdat@ghd.com  
 Purchase Order # PEDD# 1497-39-Rev1  
 Project Name: Freeman WA-Grain Handling Facility  
 Project #: 1497

**Section C**

**Invoice Information:**

Attention: Anne Walsh  
 Company: UPRR  
 Address: 1400 W. 52nd Ave, Denver, CO 80221  
 Pace Quote: Contract# 758938  
 Pace Project Manager: Jennifer Gross  
 Pace Profile #: 36447

Page: **1** of **1**

Regulatory Agency
State/Location
WA / Freeman

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMPO)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analytes Test	Requested Analysis Filtered (Y/N)										Container			
				START		END				Unpreserved	H2SO4	HNO3	HCl	NaOH + Zn Acetate	Other		Y/N	Y	Low Level VOCs by 8260	601/07470 TAL Dissolved Metals*	2320 Alkalinity	Chloride, Sulfate, Nitrate 300.0	2540 TDS	TOC 8310	Sulfide 4500	Methane, Ethane, Ethane RSK175		COD 410.4	Nitrate+Nitrite 353.2	
				DATE	TIME	DATE	TIME																							
1	Thorson-GW-010518	WTG	1/5	1000	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	001
2	Asher-GW-010518			1130	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	002
3	Silva-GW-010518			1300	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	003
4	Larg-GW-010518			1400	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	004
5	Stark-GW-010518			920	-	-	-	2			X					X														1 Container
6	Atwoods-GW-010518			1100	-	-	-	1			X					X														006
7	Atwoods-GW-010518	WTG	1/5	1110	-	-	-	1			X					X														007
8	FD03	WTG	1/5	1500	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	
9	FD04			1510	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	FD05			1520	-	-	-	8	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11	Thorson-GW-010518 MS/MS			1000	-	-	-	10	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Short hold analyses are in bold	J. L. CH2M	1/5/18	1000	[Signature]	1-6-18	930	0.6 Y Y Y
*Field filtered by client							1.5

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Jonathan Espinoza					
SIGNATURE of SAMPLER: [Signature]	DATE Signed: 1/5/18				

**Sample Condition Upon Receipt - ESI Tech Specs**     
 **Client Name:** CH2M Hill     
 **Project #:** WO# : 10416448



**Courier:**  Fed Ex     UPS     USPS     Client  
 Commercial     Pace     Speedee     Other: \_\_\_\_\_  
**Tracking Number:** 7448-1032-8024; - 8035

**Custody Seal on Cooler/Box Present?**  Yes     No     
 **Seals Intact?**  Yes     No     
 **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_     
 **Temp Blank?**  Yes     No  
**Thermometer Used:**  151401163     G87A9155100842     
 **Type of Ice:**  Wet     Blue     None     Dry     Melted

**Cooler Temp Read (°C):** 0.4, 1.3     
 **Cooler Temp Corrected (°C):** 0.6, 1.5     
 **Biological Tissue Frozen?**  Yes     No     NA  
**Temp should be above freezing to 6°C**     
 **Correction Factor:** +0.2     
**Date and Initials of Person Examining Contents:** 1-6-18 JJD

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No     
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No -Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	12. <u>extra samples, see exceptions for all tests</u>
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input checked="" type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH    Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # 1: <u>3/3</u> 2-9: <u>1/1</u>
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
3 Trip Blanks Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**     
 **Field Data Required?**  Yes     No  
 Person Contacted: Lindsey Baumann     
 Date/Time: 01/08/18

**Comments/Resolution:** Revised COC received 01/08/18

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1000</u>	Temp: <u>0.4, 1.3</u>	Corrected Temp: <u>0.6, 1.5</u>
Time: <u>1020</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

**Project Manager Review:** \_\_\_\_\_ JENNI GROSS     
 Date: 01/08/18  
 Note: Whenever there is a discrepancy affecting North Carolina compliance hold, incorrect preservative, out of temp, incorrect containers)     
 Form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of





Chain of Custody \_\_\_\_\_

WO#: 2068456



Workorder: 10416448

Workorder Name: 1497 Freeman WA-Grain Handling

Owner Received Date: 1/6/2018

Results Requested By: 1/22/2018

Report To		Subcontract To					Requested Analysis																					
Jennifer Gross Pace Analytical Seattle 596 Industry Drive, Suite 602 Tukwila, WA 98188 Phone (206)957-2426		Pace Analytical New Orleans 1000 Riverbend Blvd Suite F St. Rose, LA 70087 Phone (504)469-0333					<div style="display: flex; justify-content: space-between;"> <span>5636267 / 4500 Sulfide</span> <span>LAB USE ONLY</span> </div>																					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Other																						
1	Thorson-GW-010518	RQS	1/5/2018 10:00	10416448001	Water	3																						
2	Asher-GW-010518	PS	1/5/2018 11:30	10416448002	Water	1																						
3	Silva-GW-010518	PS	1/5/2018 13:00	10416448003	Water	1																						
4	Lang-GW-010518	PS	1/5/2018 14:00	10416448004	Water	1																						
5	FD03	PS	1/5/2018 15:00	10416448008	Water	1																						
6	FD04	PS	1/5/2018 15:10	10416448009	Water	1																						
7	FD05	PS	1/5/2018 15:20	10416448010	Water	1																						
Transfers											Comments																	
Released By	Date/Time	Received By	Date/Time																									
<i>[Signature]</i>	1-8-18 1600	Fed Ex	1/9/18 0830	= low																								
Cooler Temperature on Receipt 0.2 °C		Custody Seal <input checked="" type="checkbox"/> or N		Received on Ice <input checked="" type="checkbox"/> or N		Samples Intact <input checked="" type="checkbox"/> or N																						

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



1000 Riverbend Blvd., Suite F  
St. Rose, LA 70087

### Sample Condition Upon F

Proj

# WO# : 2068456

PM: CMM

Due Date: 01/22/18

CLIENT: PASI-MINN

Courier:  Pace Courier  Hired Courier  Fed X  UPS  DHL  USPS  Customer  Other

Custody Seal on Cooler/Box Present: [see COC]

Custody Seals intact:  Yes  No

Thermometer Used:  Therm Fisher IR 5  
 Therm Fisher IR 6  
 Therm Fisher IR 7

Type of Ice: Wet Blue None

Samples on ice: [see COC]

Cooler Temperature: [see COC]

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 01-09-18 JB

Temp must be measured from Temperature blank when present

Comments:

Temperature Blank Present??	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2	
Chain of Custody Complete:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6	
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8	
Filtered vol. Rec. for Diss. tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	9	
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10	
All containers received within manufacture's precautionary and/or expiration dates.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11	
All containers needing chemical preservation have been checked (except VOA, coliform, & O&G).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12	
All containers preservation checked found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13	If No, was preservative added? <input type="checkbox"/> Yes <input type="checkbox"/> No If added record lot no.: HNO3 _____ H2SO4 _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14	
Trip Blank Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	

#### Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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**Sample Condition Upon Receipt**

Client Name: Pace - MW Project #: \_\_\_\_\_

**WO#: 12103501**  
 PM: HRZ Due Date: 01/22/18  
 CLIENT: PACE MPLS

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Other: \_\_\_\_\_

Tracking Number: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: 4oz Pac Temp Blank?  Yes  No

Thermometer Used:  140792808 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read °C: 1.6 Cooler Temp Corrected °C: 1.9 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: +0.3 Date and Initials of Person Examining Contents: JDK 1/9/18

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5. If Fecal: <input type="checkbox"/> <8 hours <input type="checkbox"/> >8, <24 hours <input type="checkbox"/> >24 hours
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation will be checked and documented in the pH logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

CLIENT NOTIFICATION/RESOLUTION Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N  
 Project Manager Review: [Signature] Date: 1/10/18  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

January 10, 2018

David Hodson  
CH2M Hill  
9451 Atkinson St  
Suite 100  
Roseville, CA 95747

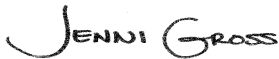
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416449

Dear David Hodson:

Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
Steve Demus, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas Certification #: 88-0680

California Certification #: 2929

CNMI Saipan Certification #: MP0003

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

Guam EPA Certification #: MN00064

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: 03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Massachusetts Certification #: M-MN064

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: MN00064

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon NwTPH Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DW Certification #: 9952 C

West Virginia DEP Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10416449001	Thorson-GW-010518	Water	01/05/18 10:00	01/06/18 09:30
10416449002	Asher-GW-010518	Water	01/05/18 11:30	01/06/18 09:30
10416449003	Silva-GW-010518	Water	01/05/18 13:00	01/06/18 09:30
10416449004	Lang-GW-010518	Water	01/05/18 14:00	01/06/18 09:30
10416449005	Trip Blank	Water	01/05/18 00:00	01/06/18 09:30
10416449006	Trip Blank 2	Water	01/05/18 00:00	01/06/18 09:30
10416449007	FD03	Water	01/05/18 15:00	01/06/18 09:30
10416449008	FD04	Water	01/05/18 15:10	01/06/18 09:30
10416449009	FD05	Water	01/05/18 15:20	01/06/18 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10416449001	Thorson-GW-010518	EPA 8260B	DJB	83	PASI-M
10416449002	Asher-GW-010518	EPA 8260B	DJB	83	PASI-M
10416449003	Silva-GW-010518	EPA 8260B	DJB	83	PASI-M
10416449004	Lang-GW-010518	EPA 8260B	DJB	83	PASI-M
10416449005	Trip Blank	EPA 8260B	DJB	83	PASI-M
10416449006	Trip Blank 2	EPA 8260B	DJB	83	PASI-M
10416449007	FD03	EPA 8260B	DJB	83	PASI-M
10416449008	FD04	EPA 8260B	DJB	83	PASI-M
10416449009	FD05	EPA 8260B	DJB	83	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** January 10, 2018

### General Information:

9 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

- Asher-GW-010518 (Lab ID: 10416449002)
- Lang-GW-010518 (Lab ID: 10416449004)
- Silva-GW-010518 (Lab ID: 10416449003)
- Thorson-GW-010518 (Lab ID: 10416449001)
- Trip Blank (Lab ID: 10416449005)
- Trip Blank 2 (Lab ID: 10416449006)

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

QC Batch: 517215

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 2810063)
  - Bromomethane
- MS (Lab ID: 2810322)
  - Bromomethane
- MSD (Lab ID: 2810323)
  - Bromomethane

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

---

**Method:** EPA 8260B

**Description:** 8260B MSV Low Level

**Client:** UPRR\_CH2M Hill

**Date:** January 10, 2018

QC Batch: 517215

L3: Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

- LCS (Lab ID: 2810063)
  - Bromomethane
  - Chloromethane

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 517045

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10416449001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2809458)
  - Carbon disulfide
- MSD (Lab ID: 2809459)
  - Carbon disulfide

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2809458)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2809459)
  - Acetone
  - Tetrahydrofuran

QC Batch: 517215

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10416572001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2810322)
  - Bromomethane
  - Chloromethane
- MSD (Lab ID: 2810323)
  - Bromomethane
  - Chloromethane

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2810322)
  - Acetone
  - Tetrahydrofuran
- MSD (Lab ID: 2810323)
  - Acetone
  - Tetrahydrofuran

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Project No.: 10416449

Sample: **Thorson-GW-010518** Lab ID: **10416449001** Collected: 01/05/18 10:00 Received: 01/06/18 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 13:11	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/08/18 13:11	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/08/18 13:11	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/08/18 13:11	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:11	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:11	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/08/18 13:11	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:11	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/08/18 13:11	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/08/18 13:11	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/08/18 13:11	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/08/18 13:11	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 13:11	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/08/18 13:11	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/08/18 13:11	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:11	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:11	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/08/18 13:11	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/08/18 13:11	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/08/18 13:11	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/08/18 13:11	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/08/18 13:11	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/08/18 13:11	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/08/18 13:11	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/08/18 13:11	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/08/18 13:11	67-64-1	M1
Acrolein	<4.8	ug/L	10.0	4.8	1		01/08/18 13:11	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/08/18 13:11	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:11	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 13:11	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/08/18 13:11	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/08/18 13:11	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/08/18 13:11	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/08/18 13:11	75-15-0	L2,M0
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/08/18 13:11	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/08/18 13:11	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/08/18 13:11	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/08/18 13:11	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Thorson-GW-010518**      **Lab ID: 10416449001**      Collected: 01/05/18 10:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/08/18 13:11	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/08/18 13:11	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 13:11	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/08/18 13:11	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/08/18 13:11	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/08/18 13:11	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/08/18 13:11	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:11	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/08/18 13:11	109-99-9	M1
Toluene	<0.17	ug/L	0.50	0.17	1		01/08/18 13:11	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/08/18 13:11	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/08/18 13:11	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/08/18 13:11	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/08/18 13:11	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/08/18 13:11	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:11	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/08/18 13:11	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:11	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:11	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/08/18 13:11	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:11	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/08/18 13:11	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/08/18 13:11	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/08/18 13:11	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/08/18 13:11	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:11	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/08/18 13:11	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		01/08/18 13:11	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		01/08/18 13:11	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		01/08/18 13:11	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416449

Sample: Asher-GW-010518 Lab ID: 10416449002 Collected: 01/05/18 11:30 Received: 01/06/18 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 13:35	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/08/18 13:35	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/08/18 13:35	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/08/18 13:35	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:35	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:35	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/08/18 13:35	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:35	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/08/18 13:35	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/08/18 13:35	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/08/18 13:35	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/08/18 13:35	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 13:35	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/08/18 13:35	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/08/18 13:35	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:35	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:35	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/08/18 13:35	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/08/18 13:35	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/08/18 13:35	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/08/18 13:35	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/08/18 13:35	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/08/18 13:35	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/08/18 13:35	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/08/18 13:35	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/08/18 13:35	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/08/18 13:35	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/08/18 13:35	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:35	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 13:35	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/08/18 13:35	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/08/18 13:35	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/08/18 13:35	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/08/18 13:35	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/08/18 13:35	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/08/18 13:35	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/08/18 13:35	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/08/18 13:35	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Asher-GW-010518**      **Lab ID: 10416449002**      Collected: 01/05/18 11:30      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/08/18 13:35	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/08/18 13:35	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 13:35	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/08/18 13:35	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/08/18 13:35	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/08/18 13:35	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/08/18 13:35	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:35	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/08/18 13:35	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/08/18 13:35	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/08/18 13:35	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/08/18 13:35	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/08/18 13:35	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/08/18 13:35	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/08/18 13:35	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:35	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/08/18 13:35	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:35	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:35	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/08/18 13:35	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:35	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/08/18 13:35	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/08/18 13:35	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/08/18 13:35	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/08/18 13:35	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:35	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/08/18 13:35	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	98	%	75-137		1		01/08/18 13:35	17060-07-0	
Toluene-d8 (S)	96	%	75-125		1		01/08/18 13:35	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		01/08/18 13:35	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416449

Sample: **Silva-GW-010518** Lab ID: **10416449003** Collected: 01/05/18 13:00 Received: 01/06/18 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 13:58	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/08/18 13:58	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/08/18 13:58	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/08/18 13:58	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:58	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:58	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/08/18 13:58	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:58	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/08/18 13:58	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/08/18 13:58	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/08/18 13:58	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/08/18 13:58	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 13:58	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/08/18 13:58	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/08/18 13:58	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 13:58	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:58	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/08/18 13:58	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/08/18 13:58	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/08/18 13:58	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/08/18 13:58	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/08/18 13:58	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/08/18 13:58	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/08/18 13:58	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/08/18 13:58	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/08/18 13:58	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/08/18 13:58	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/08/18 13:58	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:58	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 13:58	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/08/18 13:58	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/08/18 13:58	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/08/18 13:58	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/08/18 13:58	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/08/18 13:58	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/08/18 13:58	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/08/18 13:58	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/08/18 13:58	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Silva-GW-010518**      **Lab ID: 10416449003**      Collected: 01/05/18 13:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/08/18 13:58	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/08/18 13:58	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 13:58	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/08/18 13:58	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/08/18 13:58	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/08/18 13:58	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/08/18 13:58	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/08/18 13:58	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/08/18 13:58	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/08/18 13:58	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/08/18 13:58	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/08/18 13:58	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/08/18 13:58	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/08/18 13:58	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/08/18 13:58	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:58	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/08/18 13:58	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/08/18 13:58	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:58	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/08/18 13:58	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 13:58	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/08/18 13:58	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/08/18 13:58	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/08/18 13:58	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/08/18 13:58	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/08/18 13:58	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/08/18 13:58	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		01/08/18 13:58	17060-07-0	
Toluene-d8 (S)	101	%	75-125		1		01/08/18 13:58	2037-26-5	
4-Bromofluorobenzene (S)	96	%	75-125		1		01/08/18 13:58	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416449

Sample: Lang-GW-010518 Lab ID: 10416449004 Collected: 01/05/18 14:00 Received: 01/06/18 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 14:22	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/08/18 14:22	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/08/18 14:22	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/08/18 14:22	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/08/18 14:22	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/08/18 14:22	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/08/18 14:22	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 14:22	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/08/18 14:22	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/08/18 14:22	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/08/18 14:22	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/08/18 14:22	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 14:22	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/08/18 14:22	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/08/18 14:22	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 14:22	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 14:22	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/08/18 14:22	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/08/18 14:22	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/08/18 14:22	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/08/18 14:22	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/08/18 14:22	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/08/18 14:22	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/08/18 14:22	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/08/18 14:22	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/08/18 14:22	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/08/18 14:22	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/08/18 14:22	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 14:22	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 14:22	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/08/18 14:22	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/08/18 14:22	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/08/18 14:22	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/08/18 14:22	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/08/18 14:22	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/08/18 14:22	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/08/18 14:22	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/08/18 14:22	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Lang-GW-010518**      **Lab ID: 10416449004**      Collected: 01/05/18 14:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/08/18 14:22	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/08/18 14:22	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 14:22	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/08/18 14:22	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/08/18 14:22	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/08/18 14:22	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/08/18 14:22	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/08/18 14:22	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/08/18 14:22	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/08/18 14:22	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/08/18 14:22	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/08/18 14:22	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/08/18 14:22	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/08/18 14:22	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/08/18 14:22	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/08/18 14:22	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/08/18 14:22	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/08/18 14:22	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 14:22	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/08/18 14:22	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 14:22	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/08/18 14:22	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/08/18 14:22	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/08/18 14:22	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/08/18 14:22	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/08/18 14:22	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/08/18 14:22	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	97	%	75-137		1		01/08/18 14:22	17060-07-0	
Toluene-d8 (S)	100	%	75-125		1		01/08/18 14:22	2037-26-5	
4-Bromofluorobenzene (S)	97	%	75-125		1		01/08/18 14:22	460-00-4	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Trip Blank**      **Lab ID: 10416449005**      Collected: 01/05/18 00:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 12:01	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/08/18 12:01	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/08/18 12:01	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/08/18 12:01	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:01	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:01	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/08/18 12:01	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:01	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/08/18 12:01	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/08/18 12:01	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/08/18 12:01	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/08/18 12:01	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 12:01	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/08/18 12:01	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/08/18 12:01	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:01	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 12:01	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/08/18 12:01	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/08/18 12:01	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/08/18 12:01	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/08/18 12:01	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/08/18 12:01	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/08/18 12:01	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/08/18 12:01	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/08/18 12:01	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/08/18 12:01	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/08/18 12:01	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/08/18 12:01	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 12:01	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 12:01	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/08/18 12:01	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/08/18 12:01	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/08/18 12:01	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/08/18 12:01	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/08/18 12:01	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/08/18 12:01	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/08/18 12:01	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/08/18 12:01	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Trip Blank**      **Lab ID: 10416449005**      Collected: 01/05/18 00:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/08/18 12:01	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/08/18 12:01	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 12:01	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/08/18 12:01	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/08/18 12:01	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/08/18 12:01	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/08/18 12:01	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/08/18 12:01	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/08/18 12:01	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/08/18 12:01	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/08/18 12:01	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/08/18 12:01	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/08/18 12:01	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/08/18 12:01	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/08/18 12:01	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/08/18 12:01	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/08/18 12:01	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/08/18 12:01	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 12:01	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/08/18 12:01	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 12:01	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/08/18 12:01	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/08/18 12:01	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/08/18 12:01	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/08/18 12:01	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:01	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/08/18 12:01	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	96	%	75-137		1		01/08/18 12:01	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		01/08/18 12:01	2037-26-5	
4-Bromofluorobenzene (S)	92	%	75-125		1		01/08/18 12:01	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416449

**Sample: Trip Blank 2**      **Lab ID: 10416449006**      Collected: 01/05/18 00:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 12:24	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/08/18 12:24	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/08/18 12:24	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/08/18 12:24	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:24	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:24	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/08/18 12:24	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:24	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/08/18 12:24	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/08/18 12:24	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/08/18 12:24	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/08/18 12:24	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/08/18 12:24	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/08/18 12:24	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/08/18 12:24	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/08/18 12:24	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 12:24	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/08/18 12:24	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/08/18 12:24	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/08/18 12:24	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/08/18 12:24	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/08/18 12:24	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/08/18 12:24	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/08/18 12:24	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/08/18 12:24	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/08/18 12:24	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/08/18 12:24	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/08/18 12:24	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/08/18 12:24	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 12:24	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/08/18 12:24	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/08/18 12:24	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/08/18 12:24	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/08/18 12:24	75-15-0	L2
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/08/18 12:24	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/08/18 12:24	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/08/18 12:24	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/08/18 12:24	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	124-48-1	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: Trip Blank 2**      **Lab ID: 10416449006**      Collected: 01/05/18 00:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/08/18 12:24	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/08/18 12:24	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/08/18 12:24	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/08/18 12:24	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/08/18 12:24	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/08/18 12:24	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/08/18 12:24	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/08/18 12:24	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/08/18 12:24	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/08/18 12:24	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/08/18 12:24	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/08/18 12:24	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/08/18 12:24	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/08/18 12:24	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/08/18 12:24	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/08/18 12:24	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/08/18 12:24	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/08/18 12:24	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 12:24	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/08/18 12:24	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/08/18 12:24	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/08/18 12:24	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/08/18 12:24	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/08/18 12:24	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/08/18 12:24	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/08/18 12:24	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/08/18 12:24	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	95	%	75-137		1		01/08/18 12:24	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		01/08/18 12:24	2037-26-5	
4-Bromofluorobenzene (S)	91	%	75-125		1		01/08/18 12:24	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: FD03**      **Lab ID: 10416449007**      Collected: 01/05/18 15:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/09/18 15:01	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/09/18 15:01	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/09/18 15:01	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/09/18 15:01	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:01	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:01	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/09/18 15:01	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:01	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/09/18 15:01	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/09/18 15:01	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/09/18 15:01	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/09/18 15:01	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/09/18 15:01	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/09/18 15:01	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/09/18 15:01	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:01	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:01	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/09/18 15:01	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/09/18 15:01	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/09/18 15:01	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/09/18 15:01	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/09/18 15:01	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/09/18 15:01	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/09/18 15:01	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/09/18 15:01	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/09/18 15:01	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/09/18 15:01	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/09/18 15:01	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:01	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/09/18 15:01	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/09/18 15:01	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/09/18 15:01	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/09/18 15:01	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/09/18 15:01	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/09/18 15:01	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/09/18 15:01	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/09/18 15:01	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/09/18 15:01	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: FD03**      **Lab ID: 10416449007**      Collected: 01/05/18 15:00      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/09/18 15:01	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/09/18 15:01	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/09/18 15:01	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/09/18 15:01	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/09/18 15:01	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/09/18 15:01	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/09/18 15:01	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:01	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/09/18 15:01	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/09/18 15:01	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/09/18 15:01	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/09/18 15:01	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/09/18 15:01	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/09/18 15:01	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/09/18 15:01	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:01	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/09/18 15:01	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:01	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:01	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/09/18 15:01	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:01	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/09/18 15:01	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/09/18 15:01	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/09/18 15:01	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/09/18 15:01	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:01	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/09/18 15:01	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		01/09/18 15:01	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		01/09/18 15:01	2037-26-5	
4-Bromofluorobenzene (S)	99	%	75-125		1		01/09/18 15:01	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: FD04**      **Lab ID: 10416449008**      Collected: 01/05/18 15:10      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/09/18 15:25	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/09/18 15:25	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/09/18 15:25	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/09/18 15:25	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:25	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:25	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/09/18 15:25	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:25	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/09/18 15:25	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/09/18 15:25	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/09/18 15:25	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/09/18 15:25	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/09/18 15:25	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/09/18 15:25	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/09/18 15:25	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:25	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:25	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/09/18 15:25	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/09/18 15:25	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/09/18 15:25	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/09/18 15:25	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/09/18 15:25	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/09/18 15:25	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/09/18 15:25	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/09/18 15:25	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/09/18 15:25	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/09/18 15:25	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/09/18 15:25	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:25	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/09/18 15:25	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/09/18 15:25	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/09/18 15:25	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/09/18 15:25	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/09/18 15:25	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/09/18 15:25	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/09/18 15:25	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/09/18 15:25	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/09/18 15:25	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	124-48-1	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: FD04**      **Lab ID: 10416449008**      Collected: 01/05/18 15:10      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/09/18 15:25	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/09/18 15:25	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/09/18 15:25	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/09/18 15:25	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/09/18 15:25	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/09/18 15:25	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/09/18 15:25	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:25	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/09/18 15:25	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/09/18 15:25	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/09/18 15:25	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/09/18 15:25	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/09/18 15:25	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/09/18 15:25	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/09/18 15:25	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:25	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/09/18 15:25	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:25	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:25	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/09/18 15:25	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:25	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/09/18 15:25	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/09/18 15:25	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/09/18 15:25	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/09/18 15:25	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:25	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/09/18 15:25	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	99	%	75-137		1		01/09/18 15:25	17060-07-0	
Toluene-d8 (S)	98	%	75-125		1		01/09/18 15:25	2037-26-5	
4-Bromofluorobenzene (S)	100	%	75-125		1		01/09/18 15:25	460-00-4	

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Sample Project No.: 10416449

**Sample: FD05**      **Lab ID: 10416449009**      Collected: 01/05/18 15:20      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
1,1,1,2-Tetrachloroethane	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	630-20-6	
1,1,1-Trichloroethane	<0.15	ug/L	0.50	0.15	1		01/09/18 15:48	71-55-6	
1,1,2,2-Tetrachloroethane	<0.19	ug/L	0.50	0.19	1		01/09/18 15:48	79-34-5	
1,1,2-Trichloroethane	<0.22	ug/L	0.50	0.22	1		01/09/18 15:48	79-00-5	
1,1,2-Trichlorotrifluoroethane	<0.28	ug/L	1.0	0.28	1		01/09/18 15:48	76-13-1	
1,1-Dichloroethane	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	75-34-3	
1,1-Dichloroethene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:48	75-35-4	
1,1-Dichloropropene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:48	563-58-6	
1,2,3-Trichlorobenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	87-61-6	
1,2,3-Trichloropropane	<0.66	ug/L	4.0	0.66	1		01/09/18 15:48	96-18-4	
1,2,4-Trichlorobenzene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:48	120-82-1	
1,2,4-Trimethylbenzene	<0.098	ug/L	0.50	0.098	1		01/09/18 15:48	95-63-6	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	4.0	1.0	1		01/09/18 15:48	96-12-8	
1,2-Dibromoethane (EDB)	<0.17	ug/L	0.50	0.17	1		01/09/18 15:48	106-93-4	
1,2-Dichlorobenzene	<0.21	ug/L	0.50	0.21	1		01/09/18 15:48	95-50-1	
1,2-Dichloroethane	<0.15	ug/L	0.50	0.15	1		01/09/18 15:48	107-06-2	
1,2-Dichloroethene (Total)	<0.41	ug/L	1.0	0.41	1		01/09/18 15:48	540-59-0	
1,2-Dichloropropane	<0.62	ug/L	4.0	0.62	1		01/09/18 15:48	78-87-5	
1,3,5-Trimethylbenzene	<0.18	ug/L	0.50	0.18	1		01/09/18 15:48	108-67-8	
1,3-Dichlorobenzene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:48	541-73-1	
1,3-Dichloropropane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	142-28-9	
1,4-Dichlorobenzene	<0.10	ug/L	0.50	0.10	1		01/09/18 15:48	106-46-7	
1,4-Dioxane (p-Dioxane)	<22.6	ug/L	200	22.6	1		01/09/18 15:48	123-91-1	
2,2,4-Trimethylpentane	<1.3	ug/L	4.0	1.3	1		01/09/18 15:48	540-84-1	
2,2-Dichloropropane	<0.40	ug/L	1.0	0.40	1		01/09/18 15:48	594-20-7	
2-Butanone (MEK)	<2.4	ug/L	5.0	2.4	1		01/09/18 15:48	78-93-3	
2-Chlorotoluene	<0.20	ug/L	0.50	0.20	1		01/09/18 15:48	95-49-8	
2-Hexanone	<2.5	ug/L	5.0	2.5	1		01/09/18 15:48	591-78-6	
4-Chlorotoluene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	106-43-4	
4-Methyl-2-pentanone (MIBK)	<0.55	ug/L	5.0	0.55	1		01/09/18 15:48	108-10-1	
Acetone	<8.8	ug/L	20.0	8.8	1		01/09/18 15:48	67-64-1	
Acrolein	<4.8	ug/L	10.0	4.8	1		01/09/18 15:48	107-02-8	
Acrylonitrile	<4.9	ug/L	10.0	4.9	1		01/09/18 15:48	107-13-1	
Benzene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	71-43-2	
Bromobenzene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:48	108-86-1	
Bromochloromethane	<0.38	ug/L	1.0	0.38	1		01/09/18 15:48	74-97-5	
Bromodichloromethane	<0.20	ug/L	0.50	0.20	1		01/09/18 15:48	75-27-4	
Bromoform	<1.0	ug/L	4.0	1.0	1		01/09/18 15:48	75-25-2	
Bromomethane	<1.5	ug/L	4.0	1.5	1		01/09/18 15:48	74-83-9	
Carbon disulfide	<0.37	ug/L	1.0	0.37	1		01/09/18 15:48	75-15-0	
Carbon tetrachloride	<0.20	ug/L	0.50	0.20	1		01/09/18 15:48	56-23-5	
Chlorobenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	108-90-7	
Chloroethane	<0.44	ug/L	1.0	0.44	1		01/09/18 15:48	75-00-3	
Chloroform	<0.46	ug/L	1.0	0.46	1		01/09/18 15:48	67-66-3	
Chloromethane	<1.1	ug/L	4.0	1.1	1		01/09/18 15:48	74-87-3	
Dibromochloromethane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	124-48-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

**Sample: FD05**      **Lab ID: 10416449009**      Collected: 01/05/18 15:20      Received: 01/06/18 09:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>8260B MSV Low Level</b>		Analytical Method: EPA 8260B							
Dibromomethane	<0.50	ug/L	1.0	0.50	1		01/09/18 15:48	74-95-3	
Dichlorodifluoromethane	<0.31	ug/L	1.0	0.31	1		01/09/18 15:48	75-71-8	
Dichlorofluoromethane	<0.38	ug/L	1.0	0.38	1		01/09/18 15:48	75-43-4	
Diisopropyl ether	<0.12	ug/L	1.0	0.12	1		01/09/18 15:48	108-20-3	
Ethyl-tert-butyl ether	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	637-92-3	
Ethylbenzene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	100-41-4	
Hexachloro-1,3-butadiene	<0.48	ug/L	1.0	0.48	1		01/09/18 15:48	87-68-3	
Isopropylbenzene (Cumene)	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	98-82-8	
Methyl-tert-butyl ether	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	1634-04-4	
Methylene Chloride	<1.2	ug/L	4.0	1.2	1		01/09/18 15:48	75-09-2	
Naphthalene	<0.42	ug/L	1.0	0.42	1		01/09/18 15:48	91-20-3	
Styrene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	100-42-5	
Tetrachloroethene	<0.16	ug/L	0.50	0.16	1		01/09/18 15:48	127-18-4	
Tetrahydrofuran	<4.3	ug/L	10.0	4.3	1		01/09/18 15:48	109-99-9	
Toluene	<0.17	ug/L	0.50	0.17	1		01/09/18 15:48	108-88-3	
Trichloroethene	<0.18	ug/L	0.40	0.18	1		01/09/18 15:48	79-01-6	
Trichlorofluoromethane	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	75-69-4	
Vinyl acetate	<1.5	ug/L	10.0	1.5	1		01/09/18 15:48	108-05-4	
Vinyl chloride	<0.096	ug/L	0.20	0.096	1		01/09/18 15:48	75-01-4	
Xylene (Total)	<0.24	ug/L	1.5	0.24	1		01/09/18 15:48	1330-20-7	
cis-1,2-Dichloroethene	<0.20	ug/L	0.50	0.20	1		01/09/18 15:48	156-59-2	
cis-1,3-Dichloropropene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:48	10061-01-5	
m&p-Xylene	<0.24	ug/L	1.0	0.24	1		01/09/18 15:48	179601-23-1	
n-Butylbenzene	<0.13	ug/L	0.50	0.13	1		01/09/18 15:48	104-51-8	
n-Propylbenzene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:48	103-65-1	
o-Xylene	<0.11	ug/L	0.50	0.11	1		01/09/18 15:48	95-47-6	
p-Isopropyltoluene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	99-87-6	
sec-Butylbenzene	<0.12	ug/L	0.50	0.12	1		01/09/18 15:48	135-98-8	
tert-Amylmethyl ether	<0.12	ug/L	0.50	0.12	1		01/09/18 15:48	994-05-8	
tert-Butyl Alcohol	<2.2	ug/L	10.0	2.2	1		01/09/18 15:48	75-65-0	
tert-Butylbenzene	<0.15	ug/L	0.50	0.15	1		01/09/18 15:48	98-06-6	
trans-1,2-Dichloroethene	<0.21	ug/L	0.50	0.21	1		01/09/18 15:48	156-60-5	
trans-1,3-Dichloropropene	<0.14	ug/L	0.50	0.14	1		01/09/18 15:48	10061-02-6	
trans-1,4-Dichloro-2-butene	<2.8	ug/L	10.0	2.8	1		01/09/18 15:48	110-57-6	
<b>Surrogates</b>									
1,2-Dichloroethane-d4 (S)	100	%	75-137		1		01/09/18 15:48	17060-07-0	
Toluene-d8 (S)	97	%	75-125		1		01/09/18 15:48	2037-26-5	
4-Bromofluorobenzene (S)	103	%	75-125		1		01/09/18 15:48	460-00-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

QC Batch: 517045

Analysis Method: EPA 8260B

QC Batch Method: EPA 8260B

Analysis Description: 8260 MSV LL Water

Associated Lab Samples: 10416449001, 10416449002, 10416449003, 10416449004, 10416449005, 10416449006

METHOD BLANK: 2809456

Matrix: Water

Associated Lab Samples: 10416449001, 10416449002, 10416449003, 10416449004, 10416449005, 10416449006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	01/08/18 11:37	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	01/08/18 11:37	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	01/08/18 11:37	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	01/08/18 11:37	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	01/08/18 11:37	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	01/08/18 11:37	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	01/08/18 11:37	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	01/08/18 11:37	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	01/08/18 11:37	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	01/08/18 11:37	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	01/08/18 11:37	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	01/08/18 11:37	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	01/08/18 11:37	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	01/08/18 11:37	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	01/08/18 11:37	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	01/08/18 11:37	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	01/08/18 11:37	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	01/08/18 11:37	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	01/08/18 11:37	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	01/08/18 11:37	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	01/08/18 11:37	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	01/08/18 11:37	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	01/08/18 11:37	
2-Hexanone	ug/L	<2.5	5.0	2.5	01/08/18 11:37	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	01/08/18 11:37	
Acetone	ug/L	<8.8	20.0	8.8	01/08/18 11:37	
Acrolein	ug/L	<4.8	10.0	4.8	01/08/18 11:37	
Acrylonitrile	ug/L	<4.9	10.0	4.9	01/08/18 11:37	
Benzene	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
Bromobenzene	ug/L	<0.16	0.50	0.16	01/08/18 11:37	
Bromochloromethane	ug/L	<0.38	1.0	0.38	01/08/18 11:37	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	01/08/18 11:37	
Bromoform	ug/L	<1.0	4.0	1.0	01/08/18 11:37	
Bromomethane	ug/L	<1.5	4.0	1.5	01/08/18 11:37	
Carbon disulfide	ug/L	<0.37	1.0	0.37	01/08/18 11:37	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	01/08/18 11:37	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

METHOD BLANK: 2809456

Matrix: Water

Associated Lab Samples: 10416449001, 10416449002, 10416449003, 10416449004, 10416449005, 10416449006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
Chloroethane	ug/L	<0.44	1.0	0.44	01/08/18 11:37	
Chloroform	ug/L	<0.46	1.0	0.46	01/08/18 11:37	
Chloromethane	ug/L	<1.1	4.0	1.1	01/08/18 11:37	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	01/08/18 11:37	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	01/08/18 11:37	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
Dibromomethane	ug/L	<0.50	1.0	0.50	01/08/18 11:37	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	01/08/18 11:37	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	01/08/18 11:37	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	01/08/18 11:37	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
Ethylbenzene	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	01/08/18 11:37	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
m&p-Xylene	ug/L	<0.24	1.0	0.24	01/08/18 11:37	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
Methylene Chloride	ug/L	<1.2	4.0	1.2	01/08/18 11:37	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	01/08/18 11:37	
Naphthalene	ug/L	<0.42	1.0	0.42	01/08/18 11:37	
o-Xylene	ug/L	<0.11	0.50	0.11	01/08/18 11:37	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	01/08/18 11:37	
Styrene	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	01/08/18 11:37	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	01/08/18 11:37	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	01/08/18 11:37	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	01/08/18 11:37	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	01/08/18 11:37	
Toluene	ug/L	<0.17	0.50	0.17	01/08/18 11:37	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	01/08/18 11:37	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	01/08/18 11:37	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	01/08/18 11:37	
Trichloroethene	ug/L	<0.18	0.40	0.18	01/08/18 11:37	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	01/08/18 11:37	
Vinyl acetate	ug/L	<1.5	10.0	1.5	01/08/18 11:37	
Vinyl chloride	ug/L	<0.096	0.20	0.096	01/08/18 11:37	
Xylene (Total)	ug/L	<0.24	1.5	0.24	01/08/18 11:37	
1,2-Dichloroethane-d4 (S)	%	94	75-137		01/08/18 11:37	
4-Bromofluorobenzene (S)	%	93	75-125		01/08/18 11:37	
Toluene-d8 (S)	%	98	75-125		01/08/18 11:37	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

LABORATORY CONTROL SAMPLE: 2809457

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	19.5	97	75-136	
1,1,1-Trichloroethane	ug/L	20	18.9	95	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	18.2	91	71-138	
1,1,2-Trichloroethane	ug/L	20	19.8	99	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	17.5	87	69-126	
1,1-Dichloroethane	ug/L	20	18.0	90	75-125	
1,1-Dichloroethene	ug/L	20	16.7	84	75-125	
1,1-Dichloropropene	ug/L	20	17.5	88	75-125	
1,2,3-Trichlorobenzene	ug/L	20	18.8	94	75-125	
1,2,3-Trichloropropane	ug/L	20	20.0	100	75-125	
1,2,4-Trichlorobenzene	ug/L	20	17.7	89	75-125	
1,2,4-Trimethylbenzene	ug/L	20	17.6	88	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	47.5	95	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	18.4	92	75-125	
1,2-Dichlorobenzene	ug/L	20	18.9	95	75-125	
1,2-Dichloroethane	ug/L	20	18.0	90	70-125	
1,2-Dichloroethene (Total)	ug/L	40	34.9	87	75-125	
1,2-Dichloropropane	ug/L	20	18.2	91	75-125	
1,3,5-Trimethylbenzene	ug/L	20	18.3	91	75-125	
1,3-Dichlorobenzene	ug/L	20	18.0	90	75-125	
1,3-Dichloropropane	ug/L	20	19.1	96	75-125	
1,4-Dichlorobenzene	ug/L	20	18.1	90	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	393	98	64-140	
2,2,4-Trimethylpentane	ug/L	20	17.1	86	68-125	
2,2-Dichloropropane	ug/L	20	19.0	95	70-131	
2-Butanone (MEK)	ug/L	100	102	102	69-125	
2-Chlorotoluene	ug/L	20	17.6	88	75-125	
2-Hexanone	ug/L	100	101	101	73-129	
4-Chlorotoluene	ug/L	20	19.2	96	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	104	104	73-125	
Acetone	ug/L	100	101	101	66-126	
Acrolein	ug/L	200	200	100	56-150	
Acrylonitrile	ug/L	200	195	98	68-129	
Benzene	ug/L	20	17.9	90	75-125	
Bromobenzene	ug/L	20	18.3	92	75-125	
Bromochloromethane	ug/L	20	18.1	91	75-126	
Bromodichloromethane	ug/L	20	18.6	93	75-133	
Bromoform	ug/L	20	20.9	105	62-142	
Bromomethane	ug/L	20	26.5	133	34-143	
Carbon disulfide	ug/L	20	12.0	60	71-125 L2	
Carbon tetrachloride	ug/L	20	18.0	90	71-145	
Chlorobenzene	ug/L	20	17.7	89	75-125	
Chloroethane	ug/L	20	16.3	82	75-125	
Chloroform	ug/L	20	18.9	95	75-125	
Chloromethane	ug/L	20	21.5	107	54-125	
cis-1,2-Dichloroethene	ug/L	20	18.4	92	75-125	
cis-1,3-Dichloropropene	ug/L	20	20.9	104	75-125	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

LABORATORY CONTROL SAMPLE: 2809457

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	19.3	96	74-141	
Dibromomethane	ug/L	20	19.4	97	75-125	
Dichlorodifluoromethane	ug/L	20	18.1	90	59-130	
Dichlorofluoromethane	ug/L	20	18.2	91	75-125	
Diisopropyl ether	ug/L	20	19.4	97	69-125	
Ethyl-tert-butyl ether	ug/L	20	19.7	99	73-125	
Ethylbenzene	ug/L	20	18.9	94	75-125	
Hexachloro-1,3-butadiene	ug/L	20	17.6	88	75-131	
Isopropylbenzene (Cumene)	ug/L	20	18.2	91	75-125	
m&p-Xylene	ug/L	40	37.5	94	75-125	
Methyl-tert-butyl ether	ug/L	20	19.7	98	75-125	
Methylene Chloride	ug/L	20	16.9	85	73-125	
n-Butylbenzene	ug/L	20	17.4	87	75-125	
n-Propylbenzene	ug/L	20	18.4	92	75-125	
Naphthalene	ug/L	20	16.9	85	74-125	
o-Xylene	ug/L	20	17.7	88	75-125	
p-Isopropyltoluene	ug/L	20	19.3	96	75-125	
sec-Butylbenzene	ug/L	20	18.8	94	75-125	
Styrene	ug/L	20	20.1	101	75-125	
tert-Amylmethyl ether	ug/L	20	19.4	97	71-126	
tert-Butyl Alcohol	ug/L	200	196	98	69-131	
tert-Butylbenzene	ug/L	20	18.2	91	75-125	
Tetrachloroethene	ug/L	20	18.6	93	75-125	
Tetrahydrofuran	ug/L	200	208	104	65-127	
Toluene	ug/L	20	17.2	86	75-125	
trans-1,2-Dichloroethene	ug/L	20	16.5	83	75-125	
trans-1,3-Dichloropropene	ug/L	20	18.1	91	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	46.5	93	30-150	
Trichloroethene	ug/L	20	19.4	97	75-125	
Trichlorofluoromethane	ug/L	20	18.1	90	71-140	
Vinyl acetate	ug/L	20	17.5	88	68-137	
Vinyl chloride	ug/L	20	18.4	92	70-125	
Xylene (Total)	ug/L	60	55.2	92	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			97	75-125	
Toluene-d8 (S)	%			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809458 2809459

Parameter	Units	2809458		2809459		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
1,1,1,2-Tetrachloroethane	ug/L	<0.14	20	19.6	18.9	98	94	75-137	4	30	
1,1,1-Trichloroethane	ug/L	<0.15	20	19.6	19.3	98	97	75-139	1	30	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	20	17.9	18.3	90	91	60-142	2	30	
1,1,2-Trichloroethane	ug/L	<0.22	20	20.3	20.0	101	100	75-128	1	30	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:		2809458		2809459									
Parameter	Units	10416449001	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	20	20	20.0	19.9	100	100	62-150	0	30		
1,1-Dichloroethane	ug/L	<0.14	20	20	18.3	17.8	91	89	70-129	2	30		
1,1-Dichloroethene	ug/L	<0.18	20	20	18.0	17.4	90	87	67-141	3	30		
1,1-Dichloropropene	ug/L	<0.18	20	20	17.8	17.5	89	87	64-144	2	30		
1,2,3-Trichlorobenzene	ug/L	<0.14	20	20	21.3	20.7	106	103	66-139	3	30		
1,2,3-Trichloropropane	ug/L	<0.66	20	20	19.5	19.8	97	99	69-134	1	30		
1,2,4-Trichlorobenzene	ug/L	<0.18	20	20	18.8	18.5	94	93	65-138	2	30		
1,2,4-Trimethylbenzene	ug/L	<0.098	20	20	17.5	17.9	87	89	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	<1.0	50	50	46.9	48.2	94	96	61-134	3	30		
1,2-Dibromoethane (EDB)	ug/L	<0.17	20	20	18.6	18.3	93	92	74-129	1	30		
1,2-Dichlorobenzene	ug/L	<0.21	20	20	18.4	18.5	92	92	68-135	0	30		
1,2-Dichloroethane	ug/L	<0.15	20	20	17.3	17.0	86	85	73-125	2	30		
1,2-Dichloroethene (Total)	ug/L	<0.41	40	40	36.5	35.7	91	89	69-134	2	30		
1,2-Dichloropropane	ug/L	<0.62	20	20	18.3	18.0	91	90	64-130	2	30		
1,3,5-Trimethylbenzene	ug/L	<0.18	20	20	18.2	17.1	91	85	64-146	6	30		
1,3-Dichlorobenzene	ug/L	<0.16	20	20	18.2	18.0	91	90	69-135	1	30		
1,3-Dichloropropane	ug/L	<0.13	20	20	18.5	19.0	93	95	67-128	2	30		
1,4-Dichlorobenzene	ug/L	<0.10	20	20	18.1	18.3	90	92	66-134	2	30		
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	400	400	397	369	99	92	58-140	7	30		
2,2,4-Trimethylpentane	ug/L	<1.3	20	20	20.0	18.9	100	95	48-150	6	30		
2,2-Dichloropropane	ug/L	<0.40	20	20	19.9	19.9	99	100	50-150	0	30		
2-Butanone (MEK)	ug/L	<2.4	100	100	99.4	104	99	104	58-125	5	30		
2-Chlorotoluene	ug/L	<0.20	20	20	17.2	17.2	86	86	65-138	0	30		
2-Hexanone	ug/L	<2.5	100	100	98.9	103	99	103	61-134	4	30		
4-Chlorotoluene	ug/L	<0.13	20	20	19.3	19.1	97	96	68-135	1	30		
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	100	100	105	108	105	108	61-130	2	30		
Acetone	ug/L	<8.8	100	100	150	149	150	149	51-140	1	30	M1	
Acrolein	ug/L	<4.8	200	200	201	211	100	106	48-150	5	30		
Acrylonitrile	ug/L	<4.9	200	200	178	194	89	97	55-134	9	30		
Benzene	ug/L	<0.13	20	20	17.8	17.9	89	90	63-132	0	30		
Bromobenzene	ug/L	<0.16	20	20	17.9	18.2	90	91	67-138	2	30		
Bromochloromethane	ug/L	<0.38	20	20	17.8	18.1	89	90	66-138	2	30		
Bromodichloromethane	ug/L	<0.20	20	20	18.2	18.4	91	92	75-137	1	30		
Bromoform	ug/L	<1.0	20	20	20.6	20.9	103	104	65-129	1	30		
Bromomethane	ug/L	<1.5	20	20	28.8	27.8	144	139	41-150	4	30		
Carbon disulfide	ug/L	<0.37	20	20	12.7	12.4	64	62	72-132	3	30	M0	
Carbon tetrachloride	ug/L	<0.20	20	20	18.7	18.4	93	92	75-150	2	30		
Chlorobenzene	ug/L	<0.14	20	20	17.9	18.3	90	92	73-127	2	30		
Chloroethane	ug/L	<0.44	20	20	16.6	17.2	83	86	74-138	4	30		
Chloroform	ug/L	<0.46	20	20	18.1	18.5	90	92	74-125	2	30		
Chloromethane	ug/L	<1.1	20	20	22.7	22.2	113	111	58-129	2	30		
cis-1,2-Dichloroethene	ug/L	<0.20	20	20	18.8	18.4	94	92	63-135	2	30		
cis-1,3-Dichloropropene	ug/L	<0.12	20	20	19.9	19.1	99	96	66-129	4	30		
Dibromochloromethane	ug/L	<0.13	20	20	19.0	18.9	95	95	75-133	0	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

Parameter	Units	2809458		2809459		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10416449001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	<0.50	20	20	19.0	19.2	95	96	68-134	1	30	
Dichlorodifluoromethane	ug/L	<0.31	20	20	22.1	22.1	110	110	72-150	0	30	
Dichlorofluoromethane	ug/L	<0.38	20	20	18.6	18.7	93	94	75-129	1	30	
Diisopropyl ether	ug/L	<0.12	20	20	18.8	18.6	94	93	62-128	1	30	
Ethyl-tert-butyl ether	ug/L	<0.13	20	20	19.0	19.5	95	98	63-132	2	30	
Ethylbenzene	ug/L	<0.14	20	20	19.3	19.0	97	95	72-130	2	30	
Hexachloro-1,3-butadiene	ug/L	<0.48	20	20	22.0	19.9	110	99	71-150	10	30	
Isopropylbenzene (Cumene)	ug/L	<0.14	20	20	18.4	18.4	92	92	70-136	0	30	
m&p-Xylene	ug/L	<0.24	40	40	37.5	39.0	94	97	64-142	4	30	
Methyl-tert-butyl ether	ug/L	<0.14	20	20	18.9	19.4	94	97	72-125	3	30	
Methylene Chloride	ug/L	<1.2	20	20	17.1	17.0	85	85	60-132	0	30	
n-Butylbenzene	ug/L	<0.13	20	20	18.4	18.1	92	90	60-150	2	30	
n-Propylbenzene	ug/L	<0.12	20	20	18.3	18.4	91	92	63-142	1	30	
Naphthalene	ug/L	<0.42	20	20	17.9	18.4	90	92	67-125	3	30	
o-Xylene	ug/L	<0.11	20	20	18.2	18.4	91	92	60-143	1	30	
p-Isopropyltoluene	ug/L	<0.14	20	20	19.5	19.3	97	97	64-146	1	30	
sec-Butylbenzene	ug/L	<0.12	20	20	19.3	19.1	97	95	67-144	1	30	
Styrene	ug/L	<0.14	20	20	20.2	20.0	101	100	67-136	1	30	
tert-Amylmethyl ether	ug/L	<0.12	20	20	18.5	19.0	93	95	60-134	3	30	
tert-Butyl Alcohol	ug/L	<2.2	200	200	209	203	104	102	56-146	3	30	
tert-Butylbenzene	ug/L	<0.15	20	20	18.6	18.3	93	92	68-135	1	30	
Tetrachloroethene	ug/L	<0.16	20	20	19.7	19.6	99	98	67-148	0	30	
Tetrahydrofuran	ug/L	<4.3	200	200	300	295	150	147	51-141	2	30	M1
Toluene	ug/L	<0.17	20	20	18.1	17.6	91	88	61-140	3	30	
trans-1,2-Dichloroethene	ug/L	<0.21	20	20	17.7	17.4	88	87	62-138	2	30	
trans-1,3-Dichloropropene	ug/L	<0.14	20	20	18.1	17.8	91	89	67-134	2	30	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	50	50	45.5	46.0	91	92	30-150	1	30	
Trichloroethene	ug/L	<0.18	20	20	20.1	19.2	100	96	64-149	4	30	
Trichlorofluoromethane	ug/L	<0.13	20	20	21.1	20.6	105	103	75-150	2	30	
Vinyl acetate	ug/L	<1.5	20	20	17.7	17.9	89	89	49-143	1	30	
Vinyl chloride	ug/L	<0.096	20	20	19.6	20.0	98	100	75-133	2	30	
Xylene (Total)	ug/L	<0.24	60	60	55.7	57.4	93	96	63-142	3	30	
1,2-Dichloroethane-d4 (S)	%						95	94	75-137			
4-Bromofluorobenzene (S)	%						96	93	75-125			
Toluene-d8 (S)	%						97	96	75-125			

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

QC Batch: 517215 Analysis Method: EPA 8260B  
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV LL Water  
Associated Lab Samples: 10416449007, 10416449008, 10416449009

METHOD BLANK: 2810062 Matrix: Water

Associated Lab Samples: 10416449007, 10416449008, 10416449009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
1,1,1-Trichloroethane	ug/L	<0.15	0.50	0.15	01/09/18 13:28	
1,1,2,2-Tetrachloroethane	ug/L	<0.19	0.50	0.19	01/09/18 13:28	
1,1,2-Trichloroethane	ug/L	<0.22	0.50	0.22	01/09/18 13:28	
1,1,2-Trichlorotrifluoroethane	ug/L	<0.28	1.0	0.28	01/09/18 13:28	
1,1-Dichloroethane	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
1,1-Dichloroethene	ug/L	<0.18	0.50	0.18	01/09/18 13:28	
1,1-Dichloropropene	ug/L	<0.18	0.50	0.18	01/09/18 13:28	
1,2,3-Trichlorobenzene	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
1,2,3-Trichloropropane	ug/L	<0.66	4.0	0.66	01/09/18 13:28	
1,2,4-Trichlorobenzene	ug/L	<0.18	0.50	0.18	01/09/18 13:28	
1,2,4-Trimethylbenzene	ug/L	<0.098	0.50	0.098	01/09/18 13:28	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	4.0	1.0	01/09/18 13:28	
1,2-Dibromoethane (EDB)	ug/L	<0.17	0.50	0.17	01/09/18 13:28	
1,2-Dichlorobenzene	ug/L	<0.21	0.50	0.21	01/09/18 13:28	
1,2-Dichloroethane	ug/L	<0.15	0.50	0.15	01/09/18 13:28	
1,2-Dichloroethene (Total)	ug/L	<0.41	1.0	0.41	01/09/18 13:28	
1,2-Dichloropropane	ug/L	<0.62	4.0	0.62	01/09/18 13:28	
1,3,5-Trimethylbenzene	ug/L	<0.18	0.50	0.18	01/09/18 13:28	
1,3-Dichlorobenzene	ug/L	<0.16	0.50	0.16	01/09/18 13:28	
1,3-Dichloropropane	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
1,4-Dichlorobenzene	ug/L	<0.10	0.50	0.10	01/09/18 13:28	
1,4-Dioxane (p-Dioxane)	ug/L	<22.6	200	22.6	01/09/18 13:28	
2,2,4-Trimethylpentane	ug/L	<1.3	4.0	1.3	01/09/18 13:28	
2,2-Dichloropropane	ug/L	<0.40	1.0	0.40	01/09/18 13:28	
2-Butanone (MEK)	ug/L	<2.4	5.0	2.4	01/09/18 13:28	
2-Chlorotoluene	ug/L	<0.20	0.50	0.20	01/09/18 13:28	
2-Hexanone	ug/L	<2.5	5.0	2.5	01/09/18 13:28	
4-Chlorotoluene	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
4-Methyl-2-pentanone (MIBK)	ug/L	<0.55	5.0	0.55	01/09/18 13:28	
Acetone	ug/L	<8.8	20.0	8.8	01/09/18 13:28	
Acrolein	ug/L	<4.8	10.0	4.8	01/09/18 13:28	
Acrylonitrile	ug/L	<4.9	10.0	4.9	01/09/18 13:28	
Benzene	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
Bromobenzene	ug/L	<0.16	0.50	0.16	01/09/18 13:28	
Bromochloromethane	ug/L	<0.38	1.0	0.38	01/09/18 13:28	
Bromodichloromethane	ug/L	<0.20	0.50	0.20	01/09/18 13:28	
Bromoform	ug/L	<1.0	4.0	1.0	01/09/18 13:28	
Bromomethane	ug/L	<1.5	4.0	1.5	01/09/18 13:28	
Carbon disulfide	ug/L	<0.37	1.0	0.37	01/09/18 13:28	
Carbon tetrachloride	ug/L	<0.20	0.50	0.20	01/09/18 13:28	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

METHOD BLANK: 2810062

Matrix: Water

Associated Lab Samples: 10416449007, 10416449008, 10416449009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chlorobenzene	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
Chloroethane	ug/L	<0.44	1.0	0.44	01/09/18 13:28	
Chloroform	ug/L	<0.46	1.0	0.46	01/09/18 13:28	
Chloromethane	ug/L	<1.1	4.0	1.1	01/09/18 13:28	
cis-1,2-Dichloroethene	ug/L	<0.20	0.50	0.20	01/09/18 13:28	
cis-1,3-Dichloropropene	ug/L	<0.12	0.50	0.12	01/09/18 13:28	
Dibromochloromethane	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
Dibromomethane	ug/L	<0.50	1.0	0.50	01/09/18 13:28	
Dichlorodifluoromethane	ug/L	<0.31	1.0	0.31	01/09/18 13:28	
Dichlorofluoromethane	ug/L	<0.38	1.0	0.38	01/09/18 13:28	
Diisopropyl ether	ug/L	<0.12	1.0	0.12	01/09/18 13:28	
Ethyl-tert-butyl ether	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
Ethylbenzene	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
Hexachloro-1,3-butadiene	ug/L	<0.48	1.0	0.48	01/09/18 13:28	
Isopropylbenzene (Cumene)	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
m&p-Xylene	ug/L	<0.24	1.0	0.24	01/09/18 13:28	
Methyl-tert-butyl ether	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
Methylene Chloride	ug/L	<1.2	4.0	1.2	01/09/18 13:28	
n-Butylbenzene	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
n-Propylbenzene	ug/L	<0.12	0.50	0.12	01/09/18 13:28	
Naphthalene	ug/L	<0.42	1.0	0.42	01/09/18 13:28	
o-Xylene	ug/L	<0.11	0.50	0.11	01/09/18 13:28	
p-Isopropyltoluene	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
sec-Butylbenzene	ug/L	<0.12	0.50	0.12	01/09/18 13:28	
Styrene	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
tert-Amylmethyl ether	ug/L	<0.12	0.50	0.12	01/09/18 13:28	
tert-Butyl Alcohol	ug/L	<2.2	10.0	2.2	01/09/18 13:28	
tert-Butylbenzene	ug/L	<0.15	0.50	0.15	01/09/18 13:28	
Tetrachloroethene	ug/L	<0.16	0.50	0.16	01/09/18 13:28	
Tetrahydrofuran	ug/L	<4.3	10.0	4.3	01/09/18 13:28	
Toluene	ug/L	<0.17	0.50	0.17	01/09/18 13:28	
trans-1,2-Dichloroethene	ug/L	<0.21	0.50	0.21	01/09/18 13:28	
trans-1,3-Dichloropropene	ug/L	<0.14	0.50	0.14	01/09/18 13:28	
trans-1,4-Dichloro-2-butene	ug/L	<2.8	10.0	2.8	01/09/18 13:28	
Trichloroethene	ug/L	<0.18	0.40	0.18	01/09/18 13:28	
Trichlorofluoromethane	ug/L	<0.13	0.50	0.13	01/09/18 13:28	
Vinyl acetate	ug/L	<1.5	10.0	1.5	01/09/18 13:28	
Vinyl chloride	ug/L	<0.096	0.20	0.096	01/09/18 13:28	
Xylene (Total)	ug/L	<0.24	1.5	0.24	01/09/18 13:28	
1,2-Dichloroethane-d4 (S)	%	98	75-137		01/09/18 13:28	
4-Bromofluorobenzene (S)	%	99	75-125		01/09/18 13:28	
Toluene-d8 (S)	%	99	75-125		01/09/18 13:28	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

LABORATORY CONTROL SAMPLE: 2810063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.2	101	75-136	
1,1,1-Trichloroethane	ug/L	20	21.0	105	75-129	
1,1,2,2-Tetrachloroethane	ug/L	20	19.4	97	71-138	
1,1,2-Trichloroethane	ug/L	20	21.2	106	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	20	21.2	106	69-126	
1,1-Dichloroethane	ug/L	20	20.4	102	75-125	
1,1-Dichloroethene	ug/L	20	21.6	108	75-125	
1,1-Dichloropropene	ug/L	20	20.9	104	75-125	
1,2,3-Trichlorobenzene	ug/L	20	19.6	98	75-125	
1,2,3-Trichloropropane	ug/L	20	20.0	100	75-125	
1,2,4-Trichlorobenzene	ug/L	20	18.8	94	75-125	
1,2,4-Trimethylbenzene	ug/L	20	19.4	97	75-125	
1,2-Dibromo-3-chloropropane	ug/L	50	46.6	93	71-130	
1,2-Dibromoethane (EDB)	ug/L	20	20.0	100	75-125	
1,2-Dichlorobenzene	ug/L	20	21.1	105	75-125	
1,2-Dichloroethane	ug/L	20	19.8	99	70-125	
1,2-Dichloroethene (Total)	ug/L	40	41.4	104	75-125	
1,2-Dichloropropane	ug/L	20	21.0	105	75-125	
1,3,5-Trimethylbenzene	ug/L	20	19.7	99	75-125	
1,3-Dichlorobenzene	ug/L	20	20.3	102	75-125	
1,3-Dichloropropane	ug/L	20	21.2	106	75-125	
1,4-Dichlorobenzene	ug/L	20	20.3	101	75-125	
1,4-Dioxane (p-Dioxane)	ug/L	400	440	110	64-140	
2,2,4-Trimethylpentane	ug/L	20	22.0	110	68-125	
2,2-Dichloropropane	ug/L	20	21.9	110	70-131	
2-Butanone (MEK)	ug/L	100	101	101	69-125	
2-Chlorotoluene	ug/L	20	20.3	102	75-125	
2-Hexanone	ug/L	100	92.2	92	73-129	
4-Chlorotoluene	ug/L	20	21.4	107	75-125	
4-Methyl-2-pentanone (MIBK)	ug/L	100	100	100	73-125	
Acetone	ug/L	100	91.0	91	66-126	
Acrolein	ug/L	200	219	110	56-150	
Acrylonitrile	ug/L	200	203	101	68-129	
Benzene	ug/L	20	21.0	105	75-125	
Bromobenzene	ug/L	20	21.1	106	75-125	
Bromochloromethane	ug/L	20	21.3	106	75-126	
Bromodichloromethane	ug/L	20	20.1	101	75-133	
Bromoform	ug/L	20	21.0	105	62-142	
Bromomethane	ug/L	20	28.8	144	34-143	CH,L3
Carbon disulfide	ug/L	20	23.0	115	71-125	
Carbon tetrachloride	ug/L	20	19.8	99	71-145	
Chlorobenzene	ug/L	20	20.2	101	75-125	
Chloroethane	ug/L	20	17.6	88	75-125	
Chloroform	ug/L	20	21.5	107	75-125	
Chloromethane	ug/L	20	26.8	134	54-125	L3
cis-1,2-Dichloroethene	ug/L	20	20.8	104	75-125	
cis-1,3-Dichloropropene	ug/L	20	23.8	119	75-125	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

LABORATORY CONTROL SAMPLE: 2810063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromochloromethane	ug/L	20	19.9	99	74-141	
Dibromomethane	ug/L	20	20.8	104	75-125	
Dichlorodifluoromethane	ug/L	20	20.7	103	59-130	
Dichlorofluoromethane	ug/L	20	20.0	100	75-125	
Diisopropyl ether	ug/L	20	22.1	110	69-125	
Ethyl-tert-butyl ether	ug/L	20	21.8	109	73-125	
Ethylbenzene	ug/L	20	21.0	105	75-125	
Hexachloro-1,3-butadiene	ug/L	20	18.3	91	75-131	
Isopropylbenzene (Cumene)	ug/L	20	19.1	96	75-125	
m&p-Xylene	ug/L	40	41.7	104	75-125	
Methyl-tert-butyl ether	ug/L	20	21.1	106	75-125	
Methylene Chloride	ug/L	20	21.7	108	73-125	
n-Butylbenzene	ug/L	20	18.7	93	75-125	
n-Propylbenzene	ug/L	20	20.0	100	75-125	
Naphthalene	ug/L	20	16.9	85	74-125	
o-Xylene	ug/L	20	19.0	95	75-125	
p-Isopropyltoluene	ug/L	20	20.5	102	75-125	
sec-Butylbenzene	ug/L	20	19.9	99	75-125	
Styrene	ug/L	20	21.3	107	75-125	
tert-Amylmethyl ether	ug/L	20	21.3	106	71-126	
tert-Butyl Alcohol	ug/L	200	223	112	69-131	
tert-Butylbenzene	ug/L	20	19.8	99	75-125	
Tetrachloroethene	ug/L	20	21.3	106	75-125	
Tetrahydrofuran	ug/L	200	198	99	65-127	
Toluene	ug/L	20	20.6	103	75-125	
trans-1,2-Dichloroethene	ug/L	20	20.6	103	75-125	
trans-1,3-Dichloropropene	ug/L	20	19.3	97	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.0	98	30-150	
Trichloroethene	ug/L	20	21.7	108	75-125	
Trichlorofluoromethane	ug/L	20	19.5	98	71-140	
Vinyl acetate	ug/L	20	19.4	97	68-137	
Vinyl chloride	ug/L	20	20.9	104	70-125	
Xylene (Total)	ug/L	60	60.7	101	75-125	
1,2-Dichloroethane-d4 (S)	%			98	75-137	
4-Bromofluorobenzene (S)	%			102	75-125	
Toluene-d8 (S)	%			97	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2810322 2810323

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result								
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	20.2	19.8	101	99	75-137	2	30		
1,1,1-Trichloroethane	ug/L	ND	20	20	21.9	20.7	110	103	75-139	6	30		
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	19.8	19.7	99	98	60-142	1	30		
1,1,2-Trichloroethane	ug/L	ND	20	20	22.2	20.9	109	102	75-128	6	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

Parameter	Units	2810322		2810323		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10416572001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
1,1,2-Trichlorotrifluoroethane	ug/L	ND	20	20	24.0	22.4	120	112	62-150	7	30		
1,1-Dichloroethane	ug/L	ND	20	20	21.5	20.2	108	101	70-129	6	30		
1,1-Dichloroethene	ug/L	ND	20	20	23.5	22.1	117	110	67-141	6	30		
1,1-Dichloropropene	ug/L	ND	20	20	21.8	20.7	109	104	64-144	5	30		
1,2,3-Trichlorobenzene	ug/L	ND	20	20	23.4	21.3	117	106	66-139	9	30		
1,2,3-Trichloropropane	ug/L	ND	20	20	20.5	20.6	102	103	69-134	1	30		
1,2,4-Trichlorobenzene	ug/L	ND	20	20	21.4	20.4	107	102	65-138	5	30		
1,2,4-Trimethylbenzene	ug/L	ND	20	20	19.4	18.9	97	95	65-143	2	30		
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	45.4	46.5	91	93	61-134	2	30		
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	20.2	19.2	101	96	74-129	5	30		
1,2-Dichlorobenzene	ug/L	ND	20	20	21.5	20.9	108	104	68-135	3	30		
1,2-Dichloroethane	ug/L	ND	20	20	19.4	18.6	96	93	73-125	4	30		
1,2-Dichloroethene (Total)	ug/L	ND	40	40	43.3	41.3	108	103	69-134	5	30		
1,2-Dichloropropane	ug/L	ND	20	20	20.5	20.3	102	101	64-130	1	30		
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.0	19.5	100	98	64-146	2	30		
1,3-Dichlorobenzene	ug/L	ND	20	20	20.4	20.0	102	100	69-135	2	30		
1,3-Dichloropropane	ug/L	ND	20	20	21.5	20.7	108	103	67-128	4	30		
1,4-Dichlorobenzene	ug/L	ND	20	20	20.7	20.2	103	101	66-134	3	30		
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	425	323	106	81	58-140	28	30		
2,2,4-Trimethylpentane	ug/L	ND	20	20	26.3	22.5	132	113	48-150	16	30		
2,2-Dichloropropane	ug/L	ND	20	20	23.1	21.6	116	108	50-150	7	30		
2-Butanone (MEK)	ug/L	ND	100	100	102	91.7	102	92	58-125	11	30		
2-Chlorotoluene	ug/L	ND	20	20	19.9	20.0	100	100	65-138	1	30		
2-Hexanone	ug/L	ND	100	100	97.0	94.8	97	95	61-134	2	30		
4-Chlorotoluene	ug/L	ND	20	20	22.4	21.9	112	109	68-135	2	30		
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	104	102	104	102	61-130	2	30		
Acetone	ug/L	ND	100	100	161	147	161	147	51-140	9	30	M1	
Acrolein	ug/L	ND	200	200	225	214	113	107	48-150	5	30		
Acrylonitrile	ug/L	ND	200	200	199	184	100	92	55-134	8	30		
Benzene	ug/L	ND	20	20	21.4	20.5	107	102	63-132	5	30		
Bromobenzene	ug/L	ND	20	20	20.6	20.5	103	102	67-138	0	30		
Bromochloromethane	ug/L	ND	20	20	21.0	20.2	105	101	66-138	4	30		
Bromodichloromethane	ug/L	ND	20	20	20.5	19.4	102	97	75-137	5	30		
Bromoform	ug/L	ND	20	20	21.3	20.6	107	103	65-129	4	30		
Bromomethane	ug/L	ND	20	20	35.9	35.2	179	176	41-150	2	30	CH,M0	
Carbon disulfide	ug/L	ND	20	20	24.8	23.0	124	115	72-132	7	30		
Carbon tetrachloride	ug/L	ND	20	20	21.3	20.4	106	102	75-150	4	30		
Chlorobenzene	ug/L	ND	20	20	20.5	20.3	102	101	73-127	1	30		
Chloroethane	ug/L	ND	20	20	18.5	17.7	92	89	74-138	4	30		
Chloroform	ug/L	ND	20	20	21.2	20.2	106	101	74-125	5	30		
Chloromethane	ug/L	ND	20	20	26.5	25.9	132	130	58-129	2	30	M0	
cis-1,2-Dichloroethene	ug/L	ND	20	20	21.5	20.1	107	100	63-135	7	30		
cis-1,3-Dichloropropene	ug/L	ND	20	20	23.3	22.4	117	112	66-129	4	30		
Dibromochloromethane	ug/L	ND	20	20	20.2	19.5	101	97	75-133	4	30		

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

Parameter	Units	2810322		2810323		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10416572001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Dibromomethane	ug/L	ND	20	20	21.4	20.2	107	101	68-134	6	30	
Dichlorodifluoromethane	ug/L	ND	20	20	23.4	22.5	117	112	72-150	4	30	
Dichlorofluoromethane	ug/L	ND	20	20	20.3	19.9	101	100	75-129	2	30	
Diisopropyl ether	ug/L	ND	20	20	22.0	20.8	110	104	62-128	5	30	
Ethyl-tert-butyl ether	ug/L	ND	20	20	21.6	20.5	108	102	63-132	5	30	
Ethylbenzene	ug/L	ND	20	20	20.9	20.2	104	101	72-130	3	30	
Hexachloro-1,3-butadiene	ug/L	ND	20	20	25.0	21.8	125	109	71-150	14	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	19.3	18.9	97	94	70-136	2	30	
m&p-Xylene	ug/L	ND	40	40	40.8	40.0	102	100	64-142	2	30	
Methyl-tert-butyl ether	ug/L	0.95	20	20	22.0	21.0	105	100	72-125	5	30	
Methylene Chloride	ug/L	ND	20	20	21.1	19.7	105	99	60-132	7	30	
n-Butylbenzene	ug/L	ND	20	20	20.5	19.1	102	95	60-150	7	30	
n-Propylbenzene	ug/L	ND	20	20	19.1	20.0	96	100	63-142	5	30	
Naphthalene	ug/L	ND	20	20	18.5	18.2	93	91	67-125	2	30	
o-Xylene	ug/L	ND	20	20	19.6	18.7	98	94	60-143	5	30	
p-Isopropyltoluene	ug/L	ND	20	20	21.4	20.6	107	103	64-146	4	30	
sec-Butylbenzene	ug/L	ND	20	20	21.3	20.3	107	101	67-144	5	30	
Styrene	ug/L	ND	20	20	21.9	21.1	110	105	67-136	4	30	
tert-Amylmethyl ether	ug/L	ND	20	20	21.5	20.2	107	101	60-134	6	30	
tert-Butyl Alcohol	ug/L	ND	200	200	231	225	115	112	56-146	3	30	
tert-Butylbenzene	ug/L	ND	20	20	20.5	20.0	102	100	68-135	2	30	
Tetrachloroethene	ug/L	ND	20	20	22.0	21.5	110	107	67-148	3	30	
Tetrahydrofuran	ug/L	ND	200	200	315	312	157	156	51-141	1	30	M1
Toluene	ug/L	ND	20	20	21.1	20.0	105	100	61-140	5	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	21.8	21.1	109	106	62-138	3	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	19.9	19.8	100	99	67-134	0	30	
trans-1,4-Dichloro-2-butene	ug/L	ND	50	50	52.0	50.3	104	101	30-150	3	30	
Trichloroethene	ug/L	1.3	20	20	23.7	23.0	112	108	64-149	3	30	
Trichlorofluoromethane	ug/L	ND	20	20	21.6	20.6	108	103	75-150	5	30	
Vinyl acetate	ug/L	ND	20	20	19.8	18.1	99	91	49-143	9	30	
Vinyl chloride	ug/L	ND	20	20	21.8	21.3	109	106	75-133	2	30	
Xylene (Total)	ug/L	ND	60	60	60.4	58.7	101	98	63-142	3	30	
1,2-Dichloroethane-d4 (S)	%						96	95	75-137			
4-Bromofluorobenzene (S)	%						100	105	75-125			
Toluene-d8 (S)	%						100	99	75-125			

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

CH The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### METHOD CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

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Parameter	Matrix	Analytical Method	Preparation Method
8260B MSV Low Level	Water	SW-846 8260B/5030B	N/A

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416449

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10416449001	Thorson-GW-010518	EPA 8260B	517045		
10416449002	Asher-GW-010518	EPA 8260B	517045		
10416449003	Silva-GW-010518	EPA 8260B	517045		
10416449004	Lang-GW-010518	EPA 8260B	517045		
10416449005	Trip Blank	EPA 8260B	517045		
10416449006	Trip Blank 2	EPA 8260B	517045		
10416449007	FD03	EPA 8260B	517215		
10416449008	FD04	EPA 8260B	517215		
10416449009	FD05	EPA 8260B	517215		

### REPORT OF LABORATORY ANALYSIS


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Sample Condition  
Upon Receipt - ESI  
Tech Specs

Client Name: CH2M HILL

Project #: **WO#: 10416449**  
  
**10416449**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 7448-1032-8024; - 8035

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No  
 Thermometer Used:  151401163  G87A9155100842      Type of Ice:  Wet  Blue  None  Dry  Melted  
 Cooler Temp Read (°C): 0.4, 1.3      Cooler Temp Corrected (°C): 0.6, 1.5      Biological Tissue Frozen?  Yes  No  NA  
 Temp should be above freezing to 6°C      Correction Factor: +0.2      Date and Initials of Person Examining Contents: 1-6-18 JDB

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume (triple volume provided for MS/MSD)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12. <u>extn samples see exceptions</u>
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , NaOH > 9 Sulfide, NaOH > 12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water) and Dioxin. Per method, VOA pH is checked after analysis	Sample # Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	14.
3 Trip Blanks Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): <u>141537</u>	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: Lindsey Baumann Date/Time: 01/08/18

Comments/Resolution: Revised COC received 01/08/18.

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1000</u>	Temp: <u>0.4, 0.3</u>	Corrected Temp: <u>0.6, 1.5</u>
Time: <u>1030</u>	put in cooler	
Time: _____	Temp: _____	Corrected Temp: _____

Project Manager Review:

JENNI GROSS

Date: 01/08/18

Note: Whenever there is a discrepancy affecting North Carolina compliance, hold, incorrect preservative, out of temp, incorrect containers)

Form will be sent to the North Carolina DEHNR Certification Office (i.e. out of state)





January 24, 2018

David Hodson  
CH2M Hill  
9451 Atkinson St  
Suite 100  
Roseville, CA 95747

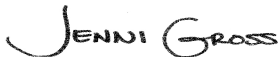
RE: Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416719

Dear David Hodson:

Enclosed are the analytical results for sample(s) received by the laboratory on January 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Gross  
jennifer.gross@pacelabs.com  
(206)957-2426  
Project Manager

Enclosures

cc: Lindsey Baumann, CH2M Hill  
Steve Demus, CH2M Hill  
Julie Lidstone, GHD  
Mark Ochsner, CH2M Hill  
Brad Ostapkowicz, CH2M Hill  
UPRR-Sysdat@ghd.com, UPRR



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416719

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### Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485  
A2LA Certification #: 2926.01  
Alabama Certification #: 40770  
Alaska Contaminated Sites Certification #: 17-009  
Alaska DW Certification #: MN00064  
Arizona Certification #: AZ0014  
Arkansas Certification #: 88-0680  
California Certification #: 2929  
CNMI Saipan Certification #: MP0003  
Colorado Certification #: MN00064  
Connecticut Certification #: PH-0256  
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137  
Florida Certification #: E87605  
Georgia Certification #: 959  
Guam EPA Certification #: MN00064  
Hawaii Certification #: MN00064  
Idaho Certification #: MN00064  
Illinois Certification #: 200011  
Indiana Certification #: C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky DW Certification #: 90062  
Kentucky WW Certification #: 90062  
Louisiana DEQ Certification #: 03086  
Louisiana DW Certification #: MN00064  
Maine Certification #: MN00064  
Maryland Certification #: 322  
Massachusetts Certification #: M-MN064

Michigan Certification #: 9909  
Minnesota Certification #: 027-053-137  
Mississippi Certification #: MN00064  
Montana Certification #: CERT0092  
Nebraska Certification #: NE-OS-18-06  
Nevada Certification #: MN00064  
New Hampshire Certification #: 2081  
New Jersey Certification #: MN002  
New York Certification #: 11647  
North Carolina DW Certification #: 27700  
North Carolina WW Certification #: 530  
North Dakota Certification #: R-036  
Ohio DW Certification #: 41244  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon NwTPH Certification #: MN300001  
Oregon Secondary Certification #: MN200001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification #: MN00064  
South Carolina Certification #: 74003001  
Tennessee Certification #: TN02818  
Texas Certification #: T104704192  
Utah Certification #: MN00064  
Virginia Certification #: 460163  
Washington Certification #: C486  
West Virginia DW Certification #: 9952 C  
West Virginia DEP Certification #: 382  
Wisconsin Certification #: 999407970

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### Virginia Minnesota Certification ID's

315 Chestnut Street, Virginia, MN 55792  
California Certification #2973  
California Certification #2973  
Alaska Certification UST-107  
Montana Certificate #CERT0103  
Alaska Certification UST-107  
Alaska Certification #MN01084  
Arizona Department of Health Certification #AZ0785

Minnesota Dept of Health Certification #: 027-137-445  
North Dakota Certification: # R-203  
Wisconsin DNR Certification #: 998027470  
WA Department of Ecology Lab ID# C1007  
Nevada DNR #MN010842018-1  
Oklahoma Department of Environmental Quality  
California Certification #2973

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### New Orleans Certification IDs

California Env. Lab Accreditation Program Branch: 11277CA  
Florida Department of Health (NELAC): E87595  
Illinois Environmental Protection Agency: 0025721  
Kansas Department of Health and Environment (NELAC): E-10266  
Louisiana Dept. of Environmental Quality (NELAC/LELAP): 02006

Pennsylvania Dept. of Env Protection (NELAC): 68-04202  
Texas Commission on Env. Quality (NELAC): T104704405-09-TX  
U.S. Dept. of Agriculture Foreign Soil Import: P330-10-00119  
Commonwealth of Virginia (TNI): 480246

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10416719001	Lashaw-GW-010918	Water	01/09/18 08:45	01/10/18 10:00
10416719002	Reed-GW-010918	Water	01/09/18 09:45	01/10/18 10:00

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
10416719001	Lashaw-GW-010918	RSK 175	MJL	3	PASI-M		
		6010C Met	DM	22	PASI-M		
		EPA 7470A	LMW	1	PASI-M		
		SM 2320B	JFP	1	PASI-M		
		SM 2540C	JFP	1	PASI-M		
		SM 4500-S-2 D	MCT	1	PASI-N		
		EPA 300.0	KEO	3	PASI-M		
		EPA 353.2	JFP	1	PASI-M		
		EPA 410.4	DCL	1	PASI-M		
		SM 5310C	CRE	1	PASI-V		
		10416719002	Reed-GW-010918	RSK 175	MJL	3	PASI-M
				6010C Met	DM	22	PASI-M
				EPA 7470A	LMW	1	PASI-M
SM 2320B	JFP			1	PASI-M		
SM 2540C	JFP			1	PASI-M		
SM 4500-S-2 D	MCT			1	PASI-N		
EPA 300.0	KEO			3	PASI-M		
EPA 353.2	JFP			1	PASI-M		
EPA 410.4	DCL			1	PASI-M		
SM 5310C	CRE			1	PASI-V		

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>10416719001</b>	<b>Lashaw-GW-010918</b>					
RSK 175	Methane	2.1J	ug/L	10.0	01/12/18 12:38	
6010C Met	Barium, Dissolved	8.8J	ug/L	10.0	01/12/18 17:42	
6010C Met	Calcium, Dissolved	25400	ug/L	500	01/12/18 17:42	
6010C Met	Copper, Dissolved	8.3J	ug/L	10.0	01/12/18 17:42	
6010C Met	Magnesium, Dissolved	12800	ug/L	500	01/12/18 17:42	
6010C Met	Manganese, Dissolved	0.39J	ug/L	5.0	01/12/18 17:42	
6010C Met	Potassium, Dissolved	3670	ug/L	2500	01/12/18 17:42	
6010C Met	Sodium, Dissolved	15000	ug/L	1000	01/12/18 17:42	
6010C Met	Vanadium, Dissolved	10.4J	ug/L	15.0	01/12/18 17:42	
6010C Met	Zinc, Dissolved	119	ug/L	20.0	01/12/18 17:42	
SM 2320B	Alkalinity, Total as CaCO3	148	mg/L	5.0	01/15/18 12:47	
SM 2540C	Total Dissolved Solids	204	mg/L	10.0	01/13/18 14:17	
EPA 300.0	Chloride	1.7	mg/L	1.2	01/10/18 15:22	B
EPA 300.0	Nitrate as N	2.5	mg/L	0.10	01/10/18 15:22	
EPA 300.0	Sulfate	5.9	mg/L	1.2	01/10/18 15:22	
EPA 353.2	Nitrogen, NO2 plus NO3	2.0	mg/L	0.040	01/11/18 11:42	
EPA 410.4	Chemical Oxygen Demand	19.0J	mg/L	50.0	01/24/18 14:42	
SM 5310C	Total Organic Carbon	0.37J	mg/L	1.0	01/15/18 22:51	
<b>10416719002</b>	<b>Reed-GW-010918</b>					
RSK 175	Methane	2.7J	ug/L	10.0	01/12/18 12:45	
6010C Met	Barium, Dissolved	44.1	ug/L	10.0	01/12/18 18:01	
6010C Met	Calcium, Dissolved	26500	ug/L	500	01/12/18 18:01	
6010C Met	Copper, Dissolved	1.0J	ug/L	10.0	01/12/18 18:01	
6010C Met	Iron, Dissolved	24.8J	ug/L	50.0	01/12/18 18:01	
6010C Met	Magnesium, Dissolved	10500	ug/L	500	01/12/18 18:01	
6010C Met	Manganese, Dissolved	1.1J	ug/L	5.0	01/12/18 18:01	
6010C Met	Potassium, Dissolved	3080	ug/L	2500	01/12/18 18:01	
6010C Met	Sodium, Dissolved	13000	ug/L	1000	01/12/18 18:01	
6010C Met	Thallium, Dissolved	7.2J	ug/L	20.0	01/12/18 18:01	
6010C Met	Vanadium, Dissolved	22.9	ug/L	15.0	01/12/18 18:01	
6010C Met	Zinc, Dissolved	5.5J	ug/L	20.0	01/12/18 18:01	
SM 2320B	Alkalinity, Total as CaCO3	134	mg/L	5.0	01/15/18 12:51	
SM 2540C	Total Dissolved Solids	198	mg/L	10.0	01/13/18 14:17	
EPA 300.0	Chloride	1.3	mg/L	1.2	01/10/18 15:37	B
EPA 300.0	Nitrate as N	0.25	mg/L	0.10	01/10/18 15:37	
EPA 300.0	Sulfate	6.9	mg/L	1.2	01/10/18 15:37	
EPA 353.2	Nitrogen, NO2 plus NO3	0.27	mg/L	0.020	01/11/18 11:28	
SM 5310C	Total Organic Carbon	0.21J	mg/L	1.0	01/15/18 23:04	

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** RSK 175

**Description:** RSK 175 AIR Headspace

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** 6010C Met

**Description:** 6010C MET ICP, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for 6010C Met. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** EPA 7470A

**Description:** 7470A Mercury, Dissolved

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for EPA 7470A. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** SM 2320B

**Description:** 2320B Alkalinity

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** SM 2540C

**Description:** 2540C Total Dissolved Solids

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for SM 2540C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** SM 4500-S-2 D

**Description:** 4500S2D Sulfide, Total

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for SM 4500-S-2 D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 99029

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10416719001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 426700)
- Sulfide, Total

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** EPA 300.0

**Description:** 300.0 IC Anions

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

### General Information:

2 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

QC Batch: 517481

B: Analyte was detected in the associated method blank.

- BLANK for HBN 517481 [WETA/339 (Lab ID: 2811522)]
  - Chloride

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

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**Method:** EPA 353.2

**Description:** 353.2 Nitrate + Nitrite

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** EPA 410.4

**Description:** 410.4 COD

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

---

**Method:** SM 5310C

**Description:** 5310C TOC

**Client:** UPRR\_CH2M Hill

**Date:** January 24, 2018

**General Information:**

2 samples were analyzed for SM 5310C. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

**Sample: Lashaw-GW-010918**      **Lab ID: 10416719001**      Collected: 01/09/18 08:45      Received: 01/10/18 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/12/18 12:38	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/12/18 12:38	74-85-1	
Methane	2.1J	ug/L	10.0	1.1	1		01/12/18 12:38	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/11/18 10:33	01/12/18 17:42	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/11/18 10:33	01/12/18 17:42	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/11/18 10:33	01/12/18 17:42	7440-38-2	
Barium, Dissolved	8.8J	ug/L	10.0	0.22	1	01/11/18 10:33	01/12/18 17:42	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/11/18 10:33	01/12/18 17:42	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/11/18 10:33	01/12/18 17:42	7440-43-9	
Calcium, Dissolved	25400	ug/L	500	24.7	1	01/11/18 10:33	01/12/18 17:42	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/11/18 10:33	01/12/18 17:42	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/11/18 10:33	01/12/18 17:42	7440-48-4	
Copper, Dissolved	8.3J	ug/L	10.0	0.83	1	01/11/18 10:33	01/12/18 17:42	7440-50-8	
Iron, Dissolved	<16.7	ug/L	50.0	16.7	1	01/11/18 10:33	01/12/18 17:42	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/11/18 10:33	01/12/18 17:42	7439-92-1	
Magnesium, Dissolved	12800	ug/L	500	2.6	1	01/11/18 10:33	01/12/18 17:42	7439-95-4	
Manganese, Dissolved	0.39J	ug/L	5.0	0.38	1	01/11/18 10:33	01/12/18 17:42	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/11/18 10:33	01/12/18 17:42	7440-02-0	
Potassium, Dissolved	3670	ug/L	2500	126	1	01/11/18 10:33	01/12/18 17:42	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/11/18 10:33	01/12/18 17:42	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/11/18 10:33	01/12/18 17:42	7440-22-4	
Sodium, Dissolved	15000	ug/L	1000	44.6	1	01/11/18 10:33	01/12/18 17:42	7440-23-5	
Thallium, Dissolved	<4.8	ug/L	20.0	4.8	1	01/11/18 10:33	01/12/18 17:42	7440-28-0	
Vanadium, Dissolved	10.4J	ug/L	15.0	0.42	1	01/11/18 10:33	01/12/18 17:42	7440-62-2	
Zinc, Dissolved	119	ug/L	20.0	1.8	1	01/11/18 10:33	01/12/18 17:42	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/11/18 09:33	01/11/18 14:55	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	148	mg/L	5.0	1.4	1		01/15/18 12:47		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	204	mg/L	10.0	5.0	1		01/13/18 14:17		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/13/18 11:48	18496-25-8	M1
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.7	mg/L	1.2	0.14	1		01/10/18 15:22	16887-00-6	B
Nitrate as N	2.5	mg/L	0.10	0.0079	1		01/10/18 15:22	14797-55-8	
Sulfate	5.9	mg/L	1.2	0.27	1		01/10/18 15:22	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

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**Sample: Lashaw-GW-010918**      **Lab ID: 10416719001**      Collected: 01/09/18 08:45      Received: 01/10/18 10:00      Matrix: Water

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Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO2 plus NO3	<b>2.0</b>	mg/L	0.040	0.015	2		01/11/18 11:42		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>19.0J</b>	mg/L	50.0	15.8	1	01/24/18 12:03	01/24/18 14:42		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.37J</b>	mg/L	1.0	0.20	1		01/15/18 22:51	7440-44-0	

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

**Sample: Reed-GW-010918**      **Lab ID: 10416719002**      Collected: 01/09/18 09:45      Received: 01/10/18 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>RSK 175 AIR Headspace</b> Analytical Method: RSK 175									
Ethane	<4.9	ug/L	10.0	4.9	1		01/12/18 12:45	74-84-0	
Ethene	<0.68	ug/L	10.0	0.68	1		01/12/18 12:45	74-85-1	
Methane	2.7J	ug/L	10.0	1.1	1		01/12/18 12:45	74-82-8	
<b>6010C MET ICP, Dissolved</b> Analytical Method: 6010C Met      Preparation Method: EPA 3010									
Aluminum, Dissolved	<8.6	ug/L	200	8.6	1	01/11/18 10:33	01/12/18 18:01	7429-90-5	
Antimony, Dissolved	<3.1	ug/L	20.0	3.1	1	01/11/18 10:33	01/12/18 18:01	7440-36-0	
Arsenic, Dissolved	<5.2	ug/L	20.0	5.2	1	01/11/18 10:33	01/12/18 18:01	7440-38-2	
Barium, Dissolved	44.1	ug/L	10.0	0.22	1	01/11/18 10:33	01/12/18 18:01	7440-39-3	
Beryllium, Dissolved	<0.11	ug/L	5.0	0.11	1	01/11/18 10:33	01/12/18 18:01	7440-41-7	
Cadmium, Dissolved	<0.46	ug/L	3.0	0.46	1	01/11/18 10:33	01/12/18 18:01	7440-43-9	
Calcium, Dissolved	26500	ug/L	500	24.7	1	01/11/18 10:33	01/12/18 18:01	7440-70-2	
Chromium, Dissolved	<0.50	ug/L	10.0	0.50	1	01/11/18 10:33	01/12/18 18:01	7440-47-3	
Cobalt, Dissolved	<1.1	ug/L	10.0	1.1	1	01/11/18 10:33	01/12/18 18:01	7440-48-4	
Copper, Dissolved	1.0J	ug/L	10.0	0.83	1	01/11/18 10:33	01/12/18 18:01	7440-50-8	
Iron, Dissolved	24.8J	ug/L	50.0	16.7	1	01/11/18 10:33	01/12/18 18:01	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	01/11/18 10:33	01/12/18 18:01	7439-92-1	
Magnesium, Dissolved	10500	ug/L	500	2.6	1	01/11/18 10:33	01/12/18 18:01	7439-95-4	
Manganese, Dissolved	1.1J	ug/L	5.0	0.38	1	01/11/18 10:33	01/12/18 18:01	7439-96-5	
Nickel, Dissolved	<1.1	ug/L	20.0	1.1	1	01/11/18 10:33	01/12/18 18:01	7440-02-0	
Potassium, Dissolved	3080	ug/L	2500	126	1	01/11/18 10:33	01/12/18 18:01	7440-09-7	
Selenium, Dissolved	<6.4	ug/L	20.0	6.4	1	01/11/18 10:33	01/12/18 18:01	7782-49-2	
Silver, Dissolved	<0.27	ug/L	10.0	0.27	1	01/11/18 10:33	01/12/18 18:01	7440-22-4	
Sodium, Dissolved	13000	ug/L	1000	44.6	1	01/11/18 10:33	01/12/18 18:01	7440-23-5	
Thallium, Dissolved	7.2J	ug/L	20.0	4.8	1	01/11/18 10:33	01/12/18 18:01	7440-28-0	
Vanadium, Dissolved	22.9	ug/L	15.0	0.42	1	01/11/18 10:33	01/12/18 18:01	7440-62-2	
Zinc, Dissolved	5.5J	ug/L	20.0	1.8	1	01/11/18 10:33	01/12/18 18:01	7440-66-6	
<b>7470A Mercury, Dissolved</b> Analytical Method: EPA 7470A      Preparation Method: EPA 7470A									
Mercury, Dissolved	<0.062	ug/L	0.20	0.062	1	01/11/18 09:33	01/11/18 14:57	7439-97-6	
<b>2320B Alkalinity</b> Analytical Method: SM 2320B									
Alkalinity, Total as CaCO <sub>3</sub>	134	mg/L	5.0	1.4	1		01/15/18 12:51		
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	198	mg/L	10.0	5.0	1		01/13/18 14:17		
<b>4500S2D Sulfide, Total</b> Analytical Method: SM 4500-S-2 D									
Sulfide, Total	<0.0050	mg/L	0.020	0.0050	1		01/13/18 11:50	18496-25-8	
<b>300.0 IC Anions</b> Analytical Method: EPA 300.0									
Chloride	1.3	mg/L	1.2	0.14	1		01/10/18 15:37	16887-00-6	B
Nitrate as N	0.25	mg/L	0.10	0.0079	1		01/10/18 15:37	14797-55-8	
Sulfate	6.9	mg/L	1.2	0.27	1		01/10/18 15:37	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

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**Sample: Reed-GW-010918**      **Lab ID: 10416719002**      Collected: 01/09/18 09:45      Received: 01/10/18 10:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>353.2 Nitrate + Nitrite</b>	Analytical Method: EPA 353.2								
Nitrogen, NO <sub>2</sub> plus NO <sub>3</sub>	<b>0.27</b>	mg/L	0.020	0.0075	1		01/11/18 11:28		
<b>410.4 COD</b>	Analytical Method: EPA 410.4      Preparation Method: EPA 410.4								
Chemical Oxygen Demand	<b>&lt;15.8</b>	mg/L	50.0	15.8	1	01/24/18 12:03	01/24/18 14:42		
<b>5310C TOC</b>	Analytical Method: SM 5310C								
Total Organic Carbon	<b>0.21J</b>	mg/L	1.0	0.20	1		01/15/18 23:04	7440-44-0	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling  
Pace Project No.: 10416719

QC Batch: 517857 Analysis Method: RSK 175  
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE  
Associated Lab Samples: 10416719001, 10416719002

METHOD BLANK: 2813218 Matrix: Water  
Associated Lab Samples: 10416719001, 10416719002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Ethane	ug/L	<4.9	10.0	4.9	01/12/18 11:47	
Ethene	ug/L	<0.68	10.0	0.68	01/12/18 11:47	
Methane	ug/L	3.3J	10.0	1.1	01/12/18 11:47	

LABORATORY CONTROL SAMPLE & LCSD: 2813219

Parameter	Units	2813220							Max RPD	Qualifiers
		Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD		
Ethane	ug/L	114	111	99.5	98	87	85-115	11	20	
Ethene	ug/L	106	104	94.5	98	89	85-115	9	20	
Methane	ug/L	60.7	59.9	57.6	99	95	85-115	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2813837

Parameter	Units	2813838										
		10416448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethane	ug/L	<4.9	114	114	101	32.7	88	28	30-150	102	20	M1, R1
Ethene	ug/L	<0.68	106	106	94.5	30.5	89	29	30-150	102	20	M1, R1
Methane	ug/L	4.0J	60.7	60.7	56.7	22.6	87	31	30-150	86	20	R1

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

QC Batch: 517610

Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A

Analysis Description: 7470A Mercury Water Dissolved

Associated Lab Samples: 10416719001, 10416719002

METHOD BLANK: 2812216

Matrix: Water

Associated Lab Samples: 10416719001, 10416719002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	<0.062	0.20	0.062	01/11/18 14:32	

LABORATORY CONTROL SAMPLE: 2812217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.2	84	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2812218 2812219

Parameter	Units	2812218		2812219		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10416674012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury, Dissolved	ug/L	ND	5	5	4.7	4.6	93	93	80-120	1	20

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

QC Batch: 517604

Analysis Method: 6010C Met

QC Batch Method: EPA 3010

Analysis Description: 6010C Water Dissolved

Associated Lab Samples: 10416719001, 10416719002

METHOD BLANK: 2812190

Matrix: Water

Associated Lab Samples: 10416719001, 10416719002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<8.6	200	8.6	01/12/18 17:26	
Antimony, Dissolved	ug/L	<3.1	20.0	3.1	01/12/18 17:26	
Arsenic, Dissolved	ug/L	<5.2	20.0	5.2	01/12/18 17:26	
Barium, Dissolved	ug/L	<0.22	10.0	0.22	01/12/18 17:26	
Beryllium, Dissolved	ug/L	<0.11	5.0	0.11	01/12/18 17:26	
Cadmium, Dissolved	ug/L	<0.46	3.0	0.46	01/12/18 17:26	
Calcium, Dissolved	ug/L	<24.7	500	24.7	01/12/18 17:26	
Chromium, Dissolved	ug/L	<0.50	10.0	0.50	01/12/18 17:26	
Cobalt, Dissolved	ug/L	<1.1	10.0	1.1	01/12/18 17:26	
Copper, Dissolved	ug/L	<0.83	10.0	0.83	01/12/18 17:26	
Iron, Dissolved	ug/L	<16.7	50.0	16.7	01/12/18 17:26	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	01/12/18 17:26	
Magnesium, Dissolved	ug/L	<2.6	500	2.6	01/12/18 17:26	
Manganese, Dissolved	ug/L	<0.38	5.0	0.38	01/12/18 17:26	
Nickel, Dissolved	ug/L	<1.1	20.0	1.1	01/12/18 17:26	
Potassium, Dissolved	ug/L	<126	2500	126	01/12/18 17:26	
Selenium, Dissolved	ug/L	<6.4	20.0	6.4	01/12/18 17:26	
Silver, Dissolved	ug/L	<0.27	10.0	0.27	01/12/18 17:26	
Sodium, Dissolved	ug/L	<44.6	1000	44.6	01/12/18 17:26	
Thallium, Dissolved	ug/L	<4.8	20.0	4.8	01/12/18 17:26	
Vanadium, Dissolved	ug/L	<0.42	15.0	0.42	01/12/18 17:26	
Zinc, Dissolved	ug/L	<1.8	20.0	1.8	01/12/18 17:26	

LABORATORY CONTROL SAMPLE: 2812191

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	20000	20200	101	80-120	
Antimony, Dissolved	ug/L	1000	973	97	80-120	
Arsenic, Dissolved	ug/L	1000	944	94	80-120	
Barium, Dissolved	ug/L	1000	975	97	80-120	
Beryllium, Dissolved	ug/L	1000	967	97	80-120	
Cadmium, Dissolved	ug/L	1000	964	96	80-120	
Calcium, Dissolved	ug/L	20000	18700	94	80-120	
Chromium, Dissolved	ug/L	1000	941	94	80-120	
Cobalt, Dissolved	ug/L	1000	962	96	80-120	
Copper, Dissolved	ug/L	1000	951	95	80-120	
Iron, Dissolved	ug/L	20000	19300	97	80-120	
Lead, Dissolved	ug/L	1000	970	97	80-120	
Magnesium, Dissolved	ug/L	20000	19500	98	80-120	
Manganese, Dissolved	ug/L	1000	965	96	80-120	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

LABORATORY CONTROL SAMPLE: 2812191

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	1000	956	96	80-120	
Potassium, Dissolved	ug/L	20000	19400	97	80-120	
Selenium, Dissolved	ug/L	1000	1020	102	80-120	
Silver, Dissolved	ug/L	500	468	94	80-120	
Sodium, Dissolved	ug/L	20000	19100	96	80-120	
Thallium, Dissolved	ug/L	1000	914	91	80-120	
Vanadium, Dissolved	ug/L	1000	943	94	80-120	
Zinc, Dissolved	ug/L	1000	978	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2812192 2812193

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10416719001 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum, Dissolved	ug/L	<8.6	20000	20000	20100	20200	101	101	75-125	0	20	
Antimony, Dissolved	ug/L	<3.1	1000	1000	972	995	97	100	75-125	2	20	
Arsenic, Dissolved	ug/L	<5.2	1000	1000	940	943	94	94	75-125	0	20	
Barium, Dissolved	ug/L	8.8J	1000	1000	971	976	96	97	75-125	1	20	
Beryllium, Dissolved	ug/L	<0.11	1000	1000	962	963	96	96	75-125	0	20	
Cadmium, Dissolved	ug/L	<0.46	1000	1000	954	957	95	96	75-125	0	20	
Calcium, Dissolved	ug/L	25400	20000	20000	43900	44200	92	94	75-125	1	20	
Chromium, Dissolved	ug/L	<0.50	1000	1000	932	936	93	94	75-125	0	20	
Cobalt, Dissolved	ug/L	<1.1	1000	1000	943	945	94	94	75-125	0	20	
Copper, Dissolved	ug/L	8.3J	1000	1000	954	957	95	95	75-125	0	20	
Iron, Dissolved	ug/L	<16.7	20000	20000	19100	19100	95	96	75-125	0	20	
Lead, Dissolved	ug/L	<3.0	1000	1000	952	955	95	95	75-125	0	20	
Magnesium, Dissolved	ug/L	12800	20000	20000	32500	32700	98	99	75-125	1	20	
Manganese, Dissolved	ug/L	0.39J	1000	1000	951	954	95	95	75-125	0	20	
Nickel, Dissolved	ug/L	<1.1	1000	1000	930	933	93	93	75-125	0	20	
Potassium, Dissolved	ug/L	3670	20000	20000	23300	23400	98	98	75-125	0	20	
Selenium, Dissolved	ug/L	<6.4	1000	1000	1010	1010	101	101	75-125	0	20	
Silver, Dissolved	ug/L	<0.27	500	500	464	465	93	93	75-125	0	20	
Sodium, Dissolved	ug/L	15000	20000	20000	33900	34100	95	96	75-125	1	20	
Thallium, Dissolved	ug/L	<4.8	1000	1000	909	909	91	91	75-125	0	20	
Vanadium, Dissolved	ug/L	10.4J	1000	1000	943	947	93	94	75-125	0	20	
Zinc, Dissolved	ug/L	119	1000	1000	1060	1060	94	94	75-125	0	20	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

QC Batch: 518069

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 10416719001, 10416719002

METHOD BLANK: 2814049

Matrix: Water

Associated Lab Samples: 10416719001, 10416719002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<1.4	5.0	1.4	01/15/18 12:15	

LABORATORY CONTROL SAMPLE & LCSD: 2814050

2814051

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	40	41.5	41.2	104	103	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2814052

2814053

Parameter	Units	10416924002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	123	40	40	169	166	115	109	80-120	1	30	

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### QUALITY CONTROL DATA

Project: 1497 Freeman WA-Grain Handling

Pace Project No.: 10416719

QC Batch: 517974

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 10416719001, 10416719002

METHOD BLANK: 2813839

Matrix: Water

Associated Lab Samples: 10416719001, 10416719002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	10.0	5.0	01/13/18 14:17	

LABORATORY CONTROL SAMPLE: 2813840

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 2813841

Parameter	Units	10416741001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2160	2200	2	10	

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