

May 29<sup>th</sup>, 2020

Mr. Byung Maeng  
Washington State Department of Ecology  
3190 160th Avenue Southeast  
Bellevue, Washington 98008

**SUBJECT:       REQUEST FOR CONTAINED-IN DETERMINATION**  
**Former Seattle Curtain Mfg. Property- VCP Project number NW3194**  
**104-112 12<sup>th</sup> Avenue**  
**Seattle, Washington 98122**

Dear Mr. Maeng:

I am requesting a contained-in determination for soil that will be excavated from the Former Seattle Curtain Manufacturing Property (the Property) in July of 2020. Current Site reference information is provided above.

#### **SITE INFORMATION**

- All contaminated soil associated with this request will be removed from within the Former Seattle Curtain Manufacturing Company Property boundaries. The address of the facility is 104-112 12<sup>th</sup> Avenue, Seattle, Washington 98122.
- VCP Project number NW3194
- Centric Partners LLC is the current owner. Contact information is as follows:

Mr. Nick Curatola  
Trent Development  
1420 5<sup>th</sup> Ave. Ste. 2200  
Seattle, Washington 98101  
[nick@onetrent.com](mailto:nick@onetrent.com)

- Urban Environmental Partners (UEP) is assisting with the cleanup action at the Site. The principal, Mr. John Funderburk had been working for Sound Earth Strategies before moving to start his own firm. The contact information for UEP is as follows:

Mr. John Funderburk  
Urban Environmental Partners llc  
2324 1<sup>st</sup> Avenue, Suite 203  
Seattle, WA 98121  
425-922-9922

- The contact information for the former Washington State department of Ecology (Ecology) Site Manager is as follows:

Tamara Welty, LG, LHG

Periodic Reviewer & Site Manager  
Washington Department of Ecology | Toxics Cleanup Program  
Northwest Regional Office | 3190 160th Avenue Southeast, Bellevue, WA 98008-5452  
Primary (425) 649-7023 | Field (425) 256-1449  
[tamara.welty@ecy.wa.gov](mailto:tamara.welty@ecy.wa.gov)

## **CLEANUP PLAN AND SCHEDULE**

The Property will be redeveloped as a six-story mixed use building with approximately 280 residential units, 16 live-work units and about 10,000 square feet of ground floor commercial spaces. The plans include an underground parking garage with soil excavation to depths ranging from 32 feet bgs at the northwest corner to 13 feet bgs the southwest corner (elevation 186').

- Soil is anticipated to be removed from the Property starting in July 2020 .

## **CONTAMINATION DESCRIPTION AND DESIGNATION**

- The waste that will be generated at the Site and subject to this contained-in request includes only soil impacted with U210-listed hazardous material sourced from a former screen print shop at 118 12<sup>th</sup> Avenue in the 1950s and early 1960s. The space was then occupied by a dry cleaner (Robertson's Laundry & Dry Cleaners) from 1966 until the early 1970s. The northwest corner of the property was occupied by a gasoline station from the early 1940s until 1990. Underground storage tanks and 761 tons of petroleum-contaminated soil (PCS) were removed from the gas station property in 1990. The primary chemical of concern (COC) is tetrachloroethene (PCE). Approximately 50-100 tons) of solvent-impacted soil is anticipated to be removed from the Site.
- Chlorinated solvent impacts (PCE) in shallow soil in the southeast parking lot (boring WES-16 and WES-17). PCE concentrations exceed the MTCA CUL in soil less than 5 feet below grade.
- Lead contaminated soil at 12 feet bgs in fill soil near the south end of the 1209 E. Fir Street building (boring BN-11) and in shallow soil at the southeast parking lot (boring WES-16).

## **SAMPLING AND REPORTING**

- Soil samples collected by UEP on the Property were collected at depth intervals of 0 to 6 feet below ground surface (bgs). Soil samples were collected from soil borings in accordance with U.S. Environmental Protection Agency (EPA) Method 5035. Each sample was analyzed for PCE in accordance with EPA Method 8260C. The laboratory analytical report for the samples collected by UEP are attached to this request.

If you have any questions or require any additional information, please don't hesitate to contact me, anytime.

Thanks, in advance.

Respectfully,

Mr. John Funderburk  
Urban Environmental Partners llc  
2324 1<sup>st</sup> Avenue, Suite 203  
Seattle, WA 98121  
425-922-9922

Attachments: Table 1, Summary of Soil Analytical result  
Figure 3, Soil Containing PCE  
Attachment A, Laboratory Analytical Report

**TABLE 1**  
**Summary of Soil Sample Analytical Results**  
**104 - 124 12<sup>th</sup> Avenue & 1209 E. Fir Street, Seattle, Washington**

Boring/ Sample I.D.	Sample Location	Sample Date	Depth (ft.)	Laboratory Analytical Results (mg/kg)			
				<b>Total Petroleum Hydrocarbons</b>  (by Method NWTPH-HCID or NWTPH-G and NWTPH-D(x))	<b>Benzene Toluene Ethyl benzene Xylenes</b>  (by EPA Methods 8021B or 8260C)	<b>Other Volatile Organic Compounds</b>  (List of 58 Additional Compounds Detectable by the Laboratory Method.)	<b>Regulated Metals</b>  (By EPA Method 6020B)
WES-15	SW corner of basement, 15 feet W of WES-2	7/23/2019	6'	Gasoline: ND (<5) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	ND (all)	NA
WES-16	NW edge of SE parking lot, adjacent to King Co. warehouse	10/1/2019	1'	Gasoline: ND (<5) Diesel: 81 <sup>x</sup> Motor Oil: 1,200	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	<b>Tetrachloroethene 0.12</b>  ND (all other)	Arsenic: 12.1 <b>Cadmium: 2.13</b> Chromium: 28.1 <b>Lead: 883</b> Mercury: ND (<1)
		10/1/2019	6'	Gasoline: ND (<5) Diesel: ND (<50) Motor Oil: ND (<250)	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	ND (all)	Lead: 3.42
WES-17	SE parking lot, 3' S of King Co. warehouse, 2' W of centerline of building	3-5-2020	1.5'	Gasoline: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	<b>Tetrachloroethene 0.13</b>  ND (all other)	NA
			4'	Gasoline: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	ND (all)	NA
WES-18	SE parking lot, 15' S of King Co. warehouse, 2' W of centerline of building	3-5-2020	1'	Gasoline: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	ND (all)	Arsenic: 2.50 Cadmium: ND (<1) Chromium: 15.7 Lead: 8.62 Mercury: ND (<1)
WES-19	SE parking lot, 22' S of King Co. warehouse, 12' W of centerline of building	3-5-2020	1.5'	Gasoline: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	ND (all)	Arsenic: 12.0 Cadmium: ND (<1) Chromium: 23.2 Lead: 2.95 Mercury: ND (<1)
WES-20	SE parking lot, 3' S, 18' W of centerline of warehouse	3-26-2020	1.5	Gasoline: NA Diesel: NA Motor Oil: NA	Benzene: ND (<0.03) Toluene: ND (<0.05) Ethylbenzene: ND (<0.05) Xylenes: ND (<0.15)	ND (all)	Arsenic: 2.89 Cadmium: ND (<1) Chromium: 20.2 Lead: 37.7 Mercury: ND (<1)

**Legend**

- Approximate Location of Monitoring Well
- Approximate Location of Soil Borings (2016 -2020)
- Approximate Location of Soil Vapor Probe
- ⊕ Approximate Location of Geotechnical Soil Borings (Soil Descriptions Only)
- - - Property Line
- Outline of Shored Excavation  
Base Elevation ranging from 186.92 to 187.92'
- ▲ XX' Approximate Depth of Excavation

- Estimated Areas of Petroleum Contaminated Soil Cleanup
- Estimated Area of Lead Contaminated Soil Cleanup
- Estimated Area of PCE and Lead Contaminated Soil Cleanup
- Estimated Area of VOC Plume in Groundwater

Expected Maximum Depth XX'

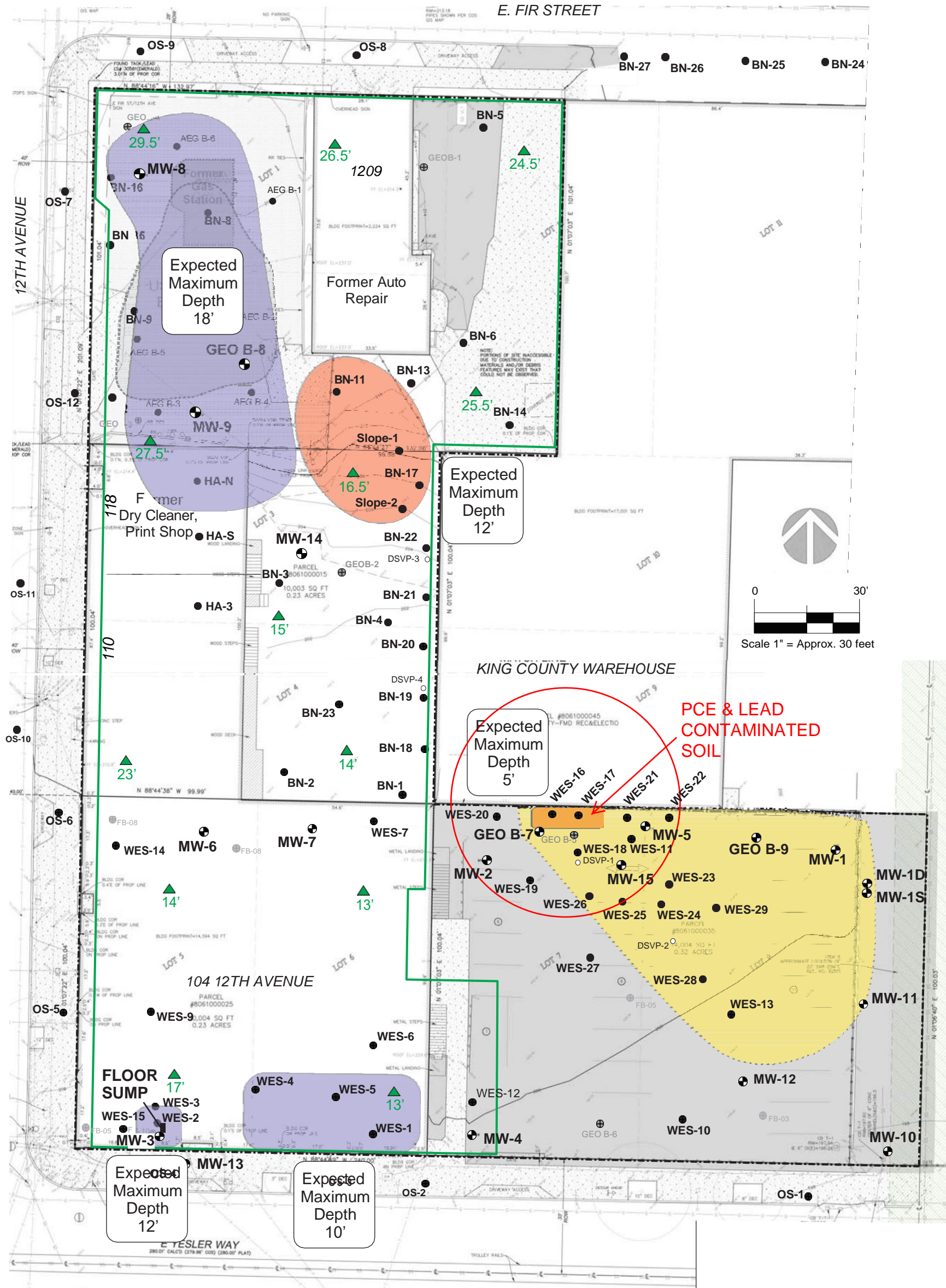
Expected Maximum Depth of Contaminated Soil Based on Remedial Investigation Sampling

Figure 3 - Anticipated Cleanup Areas

Proposed Redevelopment Property  
104-124 12th Avenue & 1209 E. Fir Street  
Seattle, WA

Project No. WES - 1591A  
Date Apr 5, 2020  
File ID. 1591F3

**WHITMAN**  
Environmental Sciences



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
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Seattle, WA 98119-2029  
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fbi@isomedia.com  
www.friedmanandbruya.com

October 15, 2019

Dan Whitman, Project Manager  
Whitman Environmental Sciences  
6812 16<sup>th</sup> Ave NE  
Seattle, WA 98115

Dear Mr Whitman:

Included are the results from the testing of material submitted on October 3, 2019 from the 12th+Yesler WES 1591A, F&BI 910079 project. There are 17 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
WES1015R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 3, 2019 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th+Yesler WES 1591A, F&BI 910079 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Whitman Environmental Sciences</u>
910079 -01	WES-16-1
910079 -02	WES-16-6
910079 -03	MW-13-6
910079 -04	MW-13-9
910079 -05	MW-13-11.5

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19  
Date Received: 10/03/19  
Project: 12th+Yesler WES 1591A, F&BI 910079  
Date Extracted: 10/04/19  
Date Analyzed: 10/04/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE  
USING METHOD NWTPH-Gx**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Gasoline Range</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150)
WES-16-1 910079-01	<5	71
WES-16-6 910079-02	<5	78
MW-13-6 910079-03	<5	76
MW-13-9 910079-04	<5	74
MW-13-11.5 910079-05	<5	77
Method Blank 09-2420 MB	<5	75

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19

Date Received: 10/03/19

Project: 12th+Yesler WES 1591A, F&BI 910079

Date Extracted: 10/03/19

Date Analyzed: 10/03/19

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-D<sub>x</sub>**

Results Reported on a Dry Weight Basis

Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
WES-16-1 910079-01	81 x	1,200	100
WES-16-6 910079-02	<50	<250	101
MW-13-6 910079-03	<50	<250	111
MW-13-9 910079-04	<50	<250	105
MW-13-11.5 910079-05	<50	<250	105
Method Blank 09-2436 MB	<50	<250	100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	WES-16-1	Client:	Whitman Environmental Sciences
Date Received:	10/03/19	Project:	12th+Yesler WES 1591A
Date Extracted:	10/04/19	Lab ID:	910079-01 and 910079-01 x5
Date Analyzed:	10/04/19	Data File:	910079-01.104 and 910079-01 x5.095
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.1
Cadmium	2.13
Chromium	28.1
Lead	883
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	NA	Project:	12th+Yesler WES 1591A
Date Extracted:	10/04/19	Lab ID:	I9-620 mb2
Date Analyzed:	10/04/19	Data File:	I9-620 mb2.101
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: WES-16-1	Client: Whitman Environmental Sciences
Date Received: 10/03/19	Project: 12th+Yesler WES 1591A
Date Extracted: 10/10/19	Lab ID: 910079-01
Date Analyzed: 10/10/19	Data File: 101050.D
Matrix: Soil	Instrument: GCMS9
Units: mg/kg (ppm) Dry Weight	Operator: AEN/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	93	107
Toluene-d8	98	87	110
4-Bromofluorobenzene	95	85	112

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.12
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	WES-16-6	Client:	Whitman Environmental Sciences
Date Received:	10/03/19	Project:	12th+Yesler WES 1591A
Date Extracted:	10/10/19	Lab ID:	910079-02
Date Analyzed:	10/11/19	Data File:	101051.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	AEN/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	93	107
Toluene-d8	98	87	110
4-Bromofluorobenzene	97	85	112

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13-6	Client:	Whitman Environmental Sciences
Date Received:	10/03/19	Project:	12th+Yesler WES 1591A
Date Extracted:	10/10/19	Lab ID:	910079-03
Date Analyzed:	10/11/19	Data File:	101052.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	AEN/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	93	107
Toluene-d8	99	87	110
4-Bromofluorobenzene	101	85	112

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13-9	Client:	Whitman Environmental Sciences
Date Received:	10/03/19	Project:	12th+Yesler WES 1591A
Date Extracted:	10/10/19	Lab ID:	910079-04
Date Analyzed:	10/11/19	Data File:	101053.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	AEN/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	93	107
Toluene-d8	97	87	110
4-Bromofluorobenzene	94	85	112

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13-11.5	Client:	Whitman Environmental Sciences
Date Received:	10/03/19	Project:	12th+Yesler WES 1591A
Date Extracted:	10/10/19	Lab ID:	910079-05
Date Analyzed:	10/11/19	Data File:	101054.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	AEN/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	93	107
Toluene-d8	98	87	110
4-Bromofluorobenzene	96	85	112

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th+Yesler WES 1591A
Date Extracted:	10/10/19	Lab ID:	09-2456 mb
Date Analyzed:	10/10/19	Data File:	101012.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	145
Toluene-d8	103	55	145
4-Bromofluorobenzene	97	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19

Date Received: 10/03/19

Project: 12th+Yesler WES 1591A, F&BI 910079

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TPH AS GASOLINE  
USING METHOD NWTPH-G<sub>x</sub>**

Laboratory Code: 910079-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	20	85	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19

Date Received: 10/03/19

Project: 12th+Yesler WES 1591A, F&BI 910079

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-D<sub>x</sub>**

Laboratory Code: 910073-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	108	104	64-133	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	108	58-147

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19

Date Received: 10/03/19

Project: 12th+Yesler WES 1591A, F&BI 910079

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 909511-01 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<5	99	104	75-125	5
Cadmium	mg/kg (ppm)	10	<5	96	98	75-125	2
Chromium	mg/kg (ppm)	50	17.6	88	88	75-125	0
Lead	mg/kg (ppm)	50	<5	106	108	75-125	2
Mercury	mg/kg (ppm)	5	<5	103	104	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	109	80-120
Cadmium	mg/kg (ppm)	10	99	80-120
Chromium	mg/kg (ppm)	50	95	80-120
Lead	mg/kg (ppm)	50	114	80-120
Mercury	mg/kg (ppm)	5	109	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19

Date Received: 10/03/19

Project: 12th+Yesler WES 1591A, F&BI 910079

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: 910176-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	29	26	10-142	11
Chloromethane	mg/kg (ppm)	2.5	<0.5	61	61	10-126	0
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	66	64	10-138	3
Bromomethane	mg/kg (ppm)	2.5	<0.5	71	69	10-163	3
Chloroethane	mg/kg (ppm)	2.5	<0.5	72	73	10-176	1
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	69	70	10-176	1
Acetone	mg/kg (ppm)	12.5	<0.5	109	90	10-163	19
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	82	80	10-160	2
Hexane	mg/kg (ppm)	2.5	0.27	58	54	10-137	3
Methylene chloride	mg/kg (ppm)	2.5	<0.5	84	85	10-156	1
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	95	95	21-145	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	86	87	14-137	1
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	89	89	19-140	0
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	75	73	10-158	3
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	88	90	25-135	2
Chloroform	mg/kg (ppm)	2.5	<0.05	90	89	21-145	1
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	95	86	19-147	10
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	91	88	12-160	3
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	92	89	10-156	3
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	90	88	17-140	2
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	89	88	9-164	1
Benzene	mg/kg (ppm)	2.5	<0.03	87	86	29-129	1
Trichloroethene	mg/kg (ppm)	2.5	<0.02	98	96	21-139	2
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	92	88	30-135	4
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	89	86	23-155	3
Dibromomethane	mg/kg (ppm)	2.5	<0.05	89	86	23-145	3
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	101	93	24-155	8
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	90	86	28-144	5
Toluene	mg/kg (ppm)	2.5	<0.05	88	90	35-130	2
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	88	83	26-149	6
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	98	92	10-205	6
2-Hexanone	mg/kg (ppm)	12.5	<0.5	95	82	15-166	15
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	90	86	31-137	5
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	89	89	20-133	0
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	93	91	28-150	2
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	91	86	28-142	6
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	89	87	32-129	2
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	91	90	32-137	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	92	93	31-143	1
m,p-Xylene	mg/kg (ppm)	5	<0.1	92	91	34-136	1
o-Xylene	mg/kg (ppm)	2.5	<0.05	97	95	33-134	2
Styrene	mg/kg (ppm)	2.5	<0.05	95	93	35-137	2
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	95	96	31-142	1
Bromoform	mg/kg (ppm)	2.5	<0.05	101	93	21-156	8
n-Propylbenzene	mg/kg (ppm)	2.5	0.095	90	92	23-146	2
Bromobenzene	mg/kg (ppm)	2.5	<0.05	88	88	34-130	0
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	0.062	94	95	18-149	2
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	86	83	28-140	4
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	89	88	25-144	1
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	90	90	31-134	0
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	88	89	31-136	1
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	93	95	30-137	2
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	0.35	109	105	10-182	4
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	94	95	23-145	1
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	94	96	21-149	2
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	88	90	30-131	2
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	93	94	29-129	1
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	88	90	31-132	2
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	106	102	11-161	4
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	97	93	22-142	6
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	86	92	10-142	7
Naphthalene	mg/kg (ppm)	2.5	<0.05	103	105	14-157	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	90	94	20-144	4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/15/19

Date Received: 10/03/19

Project: 12th+Yesler WES 1591A, F&BI 910079

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260C**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	47	10-146
Chloromethane	mg/kg (ppm)	2.5	69	27-133
Vinyl chloride	mg/kg (ppm)	2.5	75	22-139
Bromomethane	mg/kg (ppm)	2.5	75	38-114
Chloroethane	mg/kg (ppm)	2.5	79	9-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	81	10-196
Acetone	mg/kg (ppm)	12.5	95	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	87	47-128
Hexane	mg/kg (ppm)	2.5	76	43-142
Methylene chloride	mg/kg (ppm)	2.5	84	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	90	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	88	67-129
1,1-Dichloroethane	mg/kg (ppm)	2.5	87	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	85	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	85	72-127
Chloroform	mg/kg (ppm)	2.5	85	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	81	72-127
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	82	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	89	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	83	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	89	60-139
Benzene	mg/kg (ppm)	2.5	80	68-114
Trichloroethene	mg/kg (ppm)	2.5	86	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	81	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	78	72-130
Dibromomethane	mg/kg (ppm)	2.5	81	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	84	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	79	75-136
Toluene	mg/kg (ppm)	2.5	78	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	77	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	81	75-113
2-Hexanone	mg/kg (ppm)	12.5	79	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	77	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	80	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	83	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	77	74-132
Chlorobenzene	mg/kg (ppm)	2.5	80	76-111
Ethylbenzene	mg/kg (ppm)	2.5	83	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	86	69-135
m,p-Xylene	mg/kg (ppm)	5	83	78-122
o-Xylene	mg/kg (ppm)	2.5	88	77-124
Styrene	mg/kg (ppm)	2.5	85	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	88	76-127
Bromoform	mg/kg (ppm)	2.5	88	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	83	74-124
Bromobenzene	mg/kg (ppm)	2.5	80	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	86	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	77	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	79	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	83	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	81	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	84	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	87	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	85	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	87	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	83	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	88	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	84	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	92	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	94	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	95	50-153
Naphthalene	mg/kg (ppm)	2.5	99	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	93	63-138

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
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March 16, 2020

Dan Whitman, Project Manager  
Whitman Environmental Sciences  
6812 16<sup>th</sup> Ave NE  
Seattle, WA 98115

Dear Mr Whitman:

Included are the results from the testing of material submitted on March 6, 2020 from the 12th + Yesler WES-1591, F&BI 003136 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
WES0316R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 6, 2020 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th + Yesler WES-1591, F&BI 003136 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Whitman Environmental Sciences</u>
003136 -01	WES-17-1.5'
003136 -02	WES-17-4'
003136 -03	WES-18-1'
003136 -04	WES-18-5.5'
003136 -05	WES-19-1.5'
003136 -06	WES-19-5'

The 8260D matrix spike and matrix spike duplicate failed the relative percent difference for several analytes. The analytes were not detected in the samples therefore the data were acceptable.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	WES-18-1'	Client:	Whitman Environmental Sciences
Date Received:	03/06/20	Project:	12th + Yesler WES-1591
Date Extracted:	03/10/20	Lab ID:	003136-03
Date Analyzed:	03/10/20	Data File:	003136-03.085
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.56
Cadmium	<1
Chromium	15.7
Lead	8.62
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	WES-19-5'	Client:	Whitman Environmental Sciences
Date Received:	03/06/20	Project:	12th + Yesler WES-1591
Date Extracted:	03/10/20	Lab ID:	003136-06
Date Analyzed:	03/10/20	Data File:	003136-06.086
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.0
Cadmium	<1
Chromium	23.2
Lead	2.95
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th + Yesler WES-1591
Date Extracted:	03/10/20	Lab ID:	I0-142 mb2
Date Analyzed:	03/10/20	Data File:	I0-142 mb2.059
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID: WES-17-1.5'	Client: Whitman Environmental Sciences
Date Received: 03/06/20	Project: 12th + Yesler WES-1591
Date Extracted: 03/09/20	Lab ID: 003136-01
Date Analyzed: 03/12/20	Data File: 031166.D
Matrix: Soil	Instrument: GCMS4
Units: mg/kg (ppm) Dry Weight	Operator: MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	62	145
Toluene-d8	92	55	145
4-Bromofluorobenzene	91	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.13
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	WES-18-1'	Client:	Whitman Environmental Sciences
Date Received:	03/06/20	Project:	12th + Yesler WES-1591
Date Extracted:	03/09/20	Lab ID:	003136-03
Date Analyzed:	03/12/20	Data File:	031167.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	62	145
Toluene-d8	92	55	145
4-Bromofluorobenzene	91	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	WES-19-1.5'	Client:	Whitman Environmental Sciences
Date Received:	03/06/20	Project:	12th + Yesler WES-1591
Date Extracted:	03/09/20	Lab ID:	003136-05
Date Analyzed:	03/12/20	Data File:	031168.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	62	145
Toluene-d8	93	55	145
4-Bromofluorobenzene	94	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th + Yesler WES-1591
Date Extracted:	03/09/20	Lab ID:	00-565 mb
Date Analyzed:	03/09/20	Data File:	030913.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	62	145
Toluene-d8	94	55	145
4-Bromofluorobenzene	97	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 003125-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	2.03	82	76	75-125	8
Cadmium	mg/kg (ppm)	10	<1	100	98	75-125	2
Chromium	mg/kg (ppm)	50	13.8	80	88	75-125	10
Lead	mg/kg (ppm)	50	1.81	96	94	75-125	2
Mercury	mg/kg (ppm)	5	<1	97	96	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	83	80-120
Cadmium	mg/kg (ppm)	10	96	80-120
Chromium	mg/kg (ppm)	50	95	80-120
Lead	mg/kg (ppm)	50	100	80-120
Mercury	mg/kg (ppm)	5	100	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: 003144-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	31	25	10-142	21 vo
Chloromethane	mg/kg (ppm)	2.5	<0.5	56	45	10-126	22 vo
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	61	49	10-138	22 vo
Bromomethane	mg/kg (ppm)	2.5	<0.5	66	59	10-163	11
Chloroethane	mg/kg (ppm)	2.5	<0.5	68	58	10-176	16
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	71	63	10-176	12
Acetone	mg/kg (ppm)	12.5	<0.5	126	114	10-163	10
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	80	72	10-160	11
Hexane	mg/kg (ppm)	2.5	<0.25	71	68	10-137	4
Methylene chloride	mg/kg (ppm)	2.5	<0.5	89	82	10-156	8
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	75	70	21-145	7
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	84	79	14-137	6
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	88	85	19-140	3
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	87	85	10-158	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	92	87	25-135	6
Chloroform	mg/kg (ppm)	2.5	<0.05	91	89	21-145	2
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	103	108	19-147	5
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	85	89	12-160	5
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	93	88	10-156	6
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	88	86	17-140	2
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	95	92	9-164	3
Benzene	mg/kg (ppm)	2.5	<0.03	88	84	29-129	5
Trichloroethene	mg/kg (ppm)	2.5	<0.02	87	84	21-139	4
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	94	90	30-135	4
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	97	96	23-155	1
Dibromomethane	mg/kg (ppm)	2.5	<0.05	96	94	23-145	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	103	99	24-155	4
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	98	97	28-144	1
Toluene	mg/kg (ppm)	2.5	<0.05	91	89	35-130	2
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	102	103	26-149	1
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	101	101	10-205	0
2-Hexanone	mg/kg (ppm)	12.5	<0.5	108	114	15-166	5
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	100	98	31-137	2
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	91	87	20-133	4
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	100	97	28-150	3
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	102	100	28-142	2
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	93	89	32-129	4
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	93	89	32-137	4
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	102	98	31-143	4
m,p-Xylene	mg/kg (ppm)	5	<0.1	94	89	34-136	5
o-Xylene	mg/kg (ppm)	2.5	<0.05	95	89	33-134	7
Styrene	mg/kg (ppm)	2.5	<0.05	97	92	35-137	5
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	96	89	31-142	8
Bromoform	mg/kg (ppm)	2.5	<0.05	96	92	21-156	4
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	95	94	23-146	1
Bromobenzene	mg/kg (ppm)	2.5	<0.05	95	94	34-130	1
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	98	94	18-149	4
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	101	100	28-140	1
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	99	100	25-144	1
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	94	93	31-134	1
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	94	94	31-136	0
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	100	96	30-137	4
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	97	94	10-182	3
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	97	93	23-145	4
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	98	93	21-149	5
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	93	89	30-131	4
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	91	88	29-129	3
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	93	87	31-132	7
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	101	95	11-161	6
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	98	89	22-142	10
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	100	89	10-142	12
Naphthalene	mg/kg (ppm)	2.5	<0.05	106	97	14-157	9
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	102	94	20-144	8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/16/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	65	10-146
Chloromethane	mg/kg (ppm)	2.5	75	27-133
Vinyl chloride	mg/kg (ppm)	2.5	77	22-139
Bromomethane	mg/kg (ppm)	2.5	98	38-114
Chloroethane	mg/kg (ppm)	2.5	98	9-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	103	10-196
Acetone	mg/kg (ppm)	12.5	88	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	111	47-128
Hexane	mg/kg (ppm)	2.5	95	43-142
Methylene chloride	mg/kg (ppm)	2.5	116	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	100	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	110	67-129
1,1-Dichloroethane	mg/kg (ppm)	2.5	107	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	132	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	112	72-127
Chloroform	mg/kg (ppm)	2.5	107	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	80	72-127
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	90	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	122	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	98	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	130	60-139
Benzene	mg/kg (ppm)	2.5	98	68-114
Trichloroethene	mg/kg (ppm)	2.5	93	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	100	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	105	72-130
Dibromomethane	mg/kg (ppm)	2.5	98	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	105	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	94	75-136
Toluene	mg/kg (ppm)	2.5	107	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	102	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	110	75-113
2-Hexanone	mg/kg (ppm)	12.5	99	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	100	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	106	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	116	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	105	74-132
Chlorobenzene	mg/kg (ppm)	2.5	103	76-111
Ethylbenzene	mg/kg (ppm)	2.5	111	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	135	69-135
m,p-Xylene	mg/kg (ppm)	5	111	78-122
o-Xylene	mg/kg (ppm)	2.5	116	77-124
Styrene	mg/kg (ppm)	2.5	110	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	120	76-127
Bromoform	mg/kg (ppm)	2.5	120	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	112	74-124
Bromobenzene	mg/kg (ppm)	2.5	104	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	116	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	117	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	112	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	111	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	106	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	114	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	115	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	114	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	116	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	105	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	103	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	108	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	134	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	120	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	124	50-153
Naphthalene	mg/kg (ppm)	2.5	130	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	125	63-138

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
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March 18, 2020

Dan Whitman, Project Manager  
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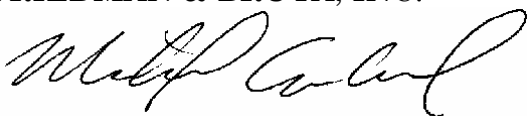
Dear Mr Whitman:

Included are the additional results from the testing of material submitted on March 6, 2020 from the 12th + Yesler WES-1591, F&BI 003136 project. There are 6 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
WES0318R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 6, 2020 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th + Yesler WES-1591, F&BI 003136 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Whitman Environmental Sciences</u>
003136 -01	WES-17-1.5'
003136 -02	WES-17-4'
003136 -03	WES-18-1'
003136 -04	WES-18-5.5'
003136 -05	WES-19-1.5'
003136 -06	WES-19-5'

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID: WES-17-4'	Client: Whitman Environmental Sciences
Date Received: 03/06/20	Project: 12th + Yesler WES-1591
Date Extracted: 03/16/20	Lab ID: 003136-02
Date Analyzed: 03/16/20	Data File: 031632.D
Matrix: Soil	Instrument: GCMS9
Units: mg/kg (ppm) Dry Weight	Operator: VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	101	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	2.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th + Yesler WES-1591
Date Extracted:	03/16/20	Lab ID:	00-616 mb2
Date Analyzed:	03/16/20	Data File:	031614.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

Date of Report: 03/18/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 003231-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	31	27	10-142	14
Chloromethane	mg/kg (ppm)	2.5	<0.5	76	63	10-126	19
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	81	68	10-138	17
Bromomethane	mg/kg (ppm)	2.5	<0.5	96	79	10-163	19
Chloroethane	mg/kg (ppm)	2.5	<0.5	92	76	10-176	19
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	78	68	10-176	14
Acetone	mg/kg (ppm)	12.5	<0.5	100	93	10-163	7
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	91	82	10-160	10
Hexane	mg/kg (ppm)	2.5	<0.25	55	60	10-137	9
Methylene chloride	mg/kg (ppm)	2.5	<0.5	103	90	10-156	13
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	94	96	21-145	2
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	85	83	14-137	2
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	84	89	19-140	6
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	81	85	10-158	5
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	86	87	25-135	1
Chloroform	mg/kg (ppm)	2.5	<0.05	88	90	21-145	2
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	73	84	19-147	14
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	78	80	12-160	3
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	86	88	10-156	2
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	80	81	17-140	1
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	90	90	9-164	0
Benzene	mg/kg (ppm)	2.5	<0.03	82	82	29-129	0
Trichloroethene	mg/kg (ppm)	2.5	<0.02	84	83	21-139	1
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	85	85	30-135	0
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	93	87	23-155	7
Dibromomethane	mg/kg (ppm)	2.5	<0.05	87	85	23-145	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	94	85	24-155	10
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	93	84	28-144	10
Toluene	mg/kg (ppm)	2.5	<0.05	84	73	35-130	14
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	90	84	26-149	7
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	89	75	10-205	17
2-Hexanone	mg/kg (ppm)	12.5	<0.5	87	82	15-166	6
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	88	90	31-137	2
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	89	75	20-133	17
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	99	88	28-150	12
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	91	77	28-142	17
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	89	85	32-129	5
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	87	74	32-137	16
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	98	86	31-143	13
m,p-Xylene	mg/kg (ppm)	5	<0.1	89	90	34-136	1
o-Xylene	mg/kg (ppm)	2.5	<0.05	90	80	33-134	12
Styrene	mg/kg (ppm)	2.5	<0.05	95	82	35-137	15
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	94	77	31-142	20
Bromoform	mg/kg (ppm)	2.5	<0.05	105	94	21-156	11
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	84	100	23-146	17
Bromobenzene	mg/kg (ppm)	2.5	<0.05	88	106	34-130	19
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	86	97	18-149	12
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	86	109	28-140	24 vo
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	82	104	25-144	24 vo
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	83	99	31-134	18
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	83	95	31-136	13
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	89	98	30-137	10
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	86	91	10-182	6
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	88	86	23-145	2
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	87	86	21-149	1
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	90	90	30-131	0
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	90	94	29-129	4
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	91	105	31-132	14
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	88	108	11-161	20
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	91	100	22-142	9
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	90	97	10-142	7
Naphthalene	mg/kg (ppm)	2.5	<0.05	93	97	14-157	4
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	92	98	20-144	6

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

Date of Report: 03/18/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	Acceptance
			Recovery LCS	Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	79	10-146
Chloromethane	mg/kg (ppm)	2.5	102	27-133
Vinyl chloride	mg/kg (ppm)	2.5	109	22-139
Bromomethane	mg/kg (ppm)	2.5	96	38-114
Chloroethane	mg/kg (ppm)	2.5	109	9-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	103	10-196
Acetone	mg/kg (ppm)	12.5	115	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	108	47-128
Hexane	mg/kg (ppm)	2.5	102	43-142
Methylene chloride	mg/kg (ppm)	2.5	109	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	111	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	105	67-129
1,1-Dichloroethane	mg/kg (ppm)	2.5	109	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	113	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	105	72-127
Chloroform	mg/kg (ppm)	2.5	107	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	105	72-127
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	83	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	109	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	90	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	104	60-139
Benzene	mg/kg (ppm)	2.5	89	68-114
Trichloroethene	mg/kg (ppm)	2.5	90	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	92	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	103	72-130
Dibromomethane	mg/kg (ppm)	2.5	94	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	96	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	104	75-136
Toluene	mg/kg (ppm)	2.5	98	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	106	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	101	75-113
2-Hexanone	mg/kg (ppm)	12.5	100	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	99	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	102	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	119	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	101	74-132
Chlorobenzene	mg/kg (ppm)	2.5	98	76-111
Ethylbenzene	mg/kg (ppm)	2.5	100	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	119	69-135
m,p-Xylene	mg/kg (ppm)	5	101	78-122
o-Xylene	mg/kg (ppm)	2.5	102	77-124
Styrene	mg/kg (ppm)	2.5	104	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	108	76-127
Bromoform	mg/kg (ppm)	2.5	127	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	98	74-124
Bromobenzene	mg/kg (ppm)	2.5	101	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	105	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	105	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	96	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	99	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	98	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	107	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	103	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	107	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	106	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	104	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	102	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	108	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	118	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	116	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	115	50-153
Naphthalene	mg/kg (ppm)	2.5	118	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	116	63-138

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Yelena Aravkina, M.S.  
Michael Erdahl, B.S.  
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March 18, 2020

Dan Whitman, Project Manager  
Whitman Environmental Sciences  
6812 16<sup>th</sup> Ave NE  
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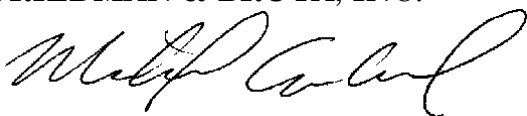
Dear Mr Whitman:

Included are the additional results from the testing of material submitted on March 6, 2020 from the 12th + Yesler WES-1591, F&BI 003136 project. There are 6 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
WES0318R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on March 6, 2020 by Friedman & Bruya, Inc. from the Whitman Environmental Sciences 12th + Yesler WES-1591, F&BI 003136 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Whitman Environmental Sciences</u>
003136 -01	WES-17-1.5'
003136 -02	WES-17-4'
003136 -03	WES-18-1'
003136 -04	WES-18-5.5'
003136 -05	WES-19-1.5'
003136 -06	WES-19-5'

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	WES-17-4'	Client:	Whitman Environmental Sciences
Date Received:	03/06/20	Project:	12th + Yesler WES-1591
Date Extracted:	03/16/20	Lab ID:	003136-02
Date Analyzed:	03/16/20	Data File:	031632.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	101	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	2.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D

Client Sample ID:	Method Blank	Client:	Whitman Environmental Sciences
Date Received:	Not Applicable	Project:	12th + Yesler WES-1591
Date Extracted:	03/16/20	Lab ID:	00-616 mb2
Date Analyzed:	03/16/20	Data File:	031614.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/18/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES  
FOR VOLATILES BY EPA METHOD 8260D**

Laboratory Code: 003231-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	31	27	10-142	14
Chloromethane	mg/kg (ppm)	2.5	<0.5	76	63	10-126	19
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	81	68	10-138	17
Bromomethane	mg/kg (ppm)	2.5	<0.5	96	79	10-163	19
Chloroethane	mg/kg (ppm)	2.5	<0.5	92	76	10-176	19
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	78	68	10-176	14
Acetone	mg/kg (ppm)	12.5	<0.5	100	93	10-163	7
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	91	82	10-160	10
Hexane	mg/kg (ppm)	2.5	<0.25	55	60	10-137	9
Methylene chloride	mg/kg (ppm)	2.5	<0.5	103	90	10-156	13
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	94	96	21-145	2
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	85	83	14-137	2
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	84	89	19-140	6
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	81	85	10-158	5
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	86	87	25-135	1
Chloroform	mg/kg (ppm)	2.5	<0.05	88	90	21-145	2
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	73	84	19-147	14
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	78	80	12-160	3
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	86	88	10-156	2
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	80	81	17-140	1
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	90	90	9-164	0
Benzene	mg/kg (ppm)	2.5	<0.03	82	82	29-129	0
Trichloroethene	mg/kg (ppm)	2.5	<0.02	84	83	21-139	1
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	85	85	30-135	0
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	93	87	23-155	7
Dibromomethane	mg/kg (ppm)	2.5	<0.05	87	85	23-145	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	94	85	24-155	10
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	93	84	28-144	10
Toluene	mg/kg (ppm)	2.5	<0.05	84	73	35-130	14
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	90	84	26-149	7
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	89	75	10-205	17
2-Hexanone	mg/kg (ppm)	12.5	<0.5	87	82	15-166	6
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	88	90	31-137	2
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	89	75	20-133	17
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	99	88	28-150	12
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	91	77	28-142	17
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	89	85	32-129	5
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	87	74	32-137	16
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	98	86	31-143	13
m,p-Xylene	mg/kg (ppm)	5	<0.1	89	90	34-136	1
o-Xylene	mg/kg (ppm)	2.5	<0.05	90	80	33-134	12
Styrene	mg/kg (ppm)	2.5	<0.05	95	82	35-137	15
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	94	77	31-142	20
Bromoform	mg/kg (ppm)	2.5	<0.05	105	94	21-156	11
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	84	100	23-146	17
Bromobenzene	mg/kg (ppm)	2.5	<0.05	88	106	34-130	19
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	86	97	18-149	12
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	86	109	28-140	24 vo
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	82	104	25-144	24 vo
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	83	99	31-134	18
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	83	95	31-136	13
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	89	98	30-137	10
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	86	91	10-182	6
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	88	86	23-145	2
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	87	86	21-149	1
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	90	90	30-131	0
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	90	94	29-129	4
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	91	105	31-132	14
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	88	108	11-161	20
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	91	100	22-142	9
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	90	97	10-142	7
Naphthalene	mg/kg (ppm)	2.5	<0.05	93	97	14-157	4
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	92	98	20-144	6

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

Date of Report: 03/18/20

Date Received: 03/06/20

Project: 12th + Yesler WES-1591, F&BI 003136

### QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	79	10-146
Chloromethane	mg/kg (ppm)	2.5	102	27-133
Vinyl chloride	mg/kg (ppm)	2.5	109	22-139
Bromomethane	mg/kg (ppm)	2.5	96	38-114
Chloroethane	mg/kg (ppm)	2.5	109	9-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	103	10-196
Acetone	mg/kg (ppm)	12.5	115	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	108	47-128
Hexane	mg/kg (ppm)	2.5	102	43-142
Methylene chloride	mg/kg (ppm)	2.5	109	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	111	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	105	67-129
1,1-Dichloroethane	mg/kg (ppm)	2.5	109	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	113	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	105	72-127
Chloroform	mg/kg (ppm)	2.5	107	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	105	72-127
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	83	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	109	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	90	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	104	60-139
Benzene	mg/kg (ppm)	2.5	89	68-114
Trichloroethene	mg/kg (ppm)	2.5	90	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	92	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	103	72-130
Dibromomethane	mg/kg (ppm)	2.5	94	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	96	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	104	75-136
Toluene	mg/kg (ppm)	2.5	98	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	106	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	101	75-113
2-Hexanone	mg/kg (ppm)	12.5	100	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	99	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	102	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	119	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	101	74-132
Chlorobenzene	mg/kg (ppm)	2.5	98	76-111
Ethylbenzene	mg/kg (ppm)	2.5	100	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	119	69-135
m,p-Xylene	mg/kg (ppm)	5	101	78-122
o-Xylene	mg/kg (ppm)	2.5	102	77-124
Styrene	mg/kg (ppm)	2.5	104	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	108	76-127
Bromoform	mg/kg (ppm)	2.5	127	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	98	74-124
Bromobenzene	mg/kg (ppm)	2.5	101	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	105	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	105	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	96	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	99	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	98	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	107	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	103	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	107	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	106	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	104	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	102	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	108	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	118	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	116	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	115	50-153
Naphthalene	mg/kg (ppm)	2.5	118	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	116	63-138

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## ENVIRONMENTAL CHEMISTS

### **Data Qualifiers & Definitions**

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

