Fremont Analytical

Chain of Custody Record and Laboratory Services Agreement

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/17/2016

Laboratory Project No (Internal): 1610280

Page: 1 of 1

Client: GeoEngineers
Address: 600 Stewart Street, Suite 1700
City, State, Zip: Seattle, WA 98103
Telephone: 253.722.2418 Fax:

Project Name: Gas Works Park Site
Project No: 0186-845-01 Task 1803
Location: Seattle
Report To (PM): Sandra Smith / Claudia De La Via
PM Email: sbsmith@geoengineers.com cdelavia@geoengineers.com
Collected by: MWB/CVD

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Arsenic (EPA 200.8) field filtered	Iron (EPA 200.8) field filtered	COD (SM5220D) field filtered	COD (SM5220)	Grain Size (ASTM D422)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Comments
1 PAI- 21B-23-28	10/16	1215	S				X	X					
2 PAI- 21B-15.8-16.5	↓	1225	S				X	X					
3 PAI- 21B-14-14.7		1220	S										Hold
4 PAI- 21B-5-161017		1530	GW	X	X	X							~~Hold~~ per S. Smith 10/18/16 Run " " 10/19/16
5 PAI- 21B-D-161017	↓	1433	GW	X	X	X							
6 PAI- sample name change per S. Smith 10/19/16													
7 PAI-													
8 PAI-													
9 PAI-													
10 PAI-													

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Tl Ti U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:
1. Groundwater arsenic and sulfide samples on ASAP TAT.
2. Groundwater iron and COD plus soil COD and grain size samples on standard TAT.
3. Groundwater and soil RLs per the WO
4. COD = Chemical oxygen demand
5. Run for dissolved metals

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	10/17/16 1606	x	10/17/16 1606
x	10/17/16 1619	x	10/17/16 1618

TAT → SameDay^ NextDay^ 2 Day 3 Day STD

^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

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info@fremontanalytical.com

GeoEngineers
Sandra Smith
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Gas Works Park Site
Work Order Number: 1610297

November 07, 2016

Attention Sandra Smith:

Fremont Analytical, Inc. received 7 sample(s) on 10/18/2016 for the analyses presented in the following report.

Chemical Oxygen Demand by SM 5220D
Dissolved Metals by EPA Method 200.8
Grain Size by ASTM D422

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

CC:
Claudia De La Via

Date: *11/07/2016*

CLIENT: GeoEngineers
Project: Gas Works Park Site
Work Order: 1610297

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1610297-001	PAI-31-15-16.5	10/18/2016 10:40 AM	10/18/2016 4:36 PM
1610297-002	PAI-31-27-29.5	10/18/2016 11:00 AM	10/18/2016 4:36 PM
1610297-003	PAI-31-S-161018	10/18/2016 1:20 PM	10/18/2016 4:36 PM
1610297-004	PAI-31-D-161018	10/18/2016 12:45 PM	10/18/2016 4:36 PM
1610297-005	PAI-32-23.4-26	10/18/2016 3:25 PM	10/18/2016 4:36 PM
1610297-006	PAI-32-21-23.4	10/18/2016 3:25 PM	10/18/2016 4:36 PM
1610297-007	PAI-32-D-161018	10/18/2016 4:12 PM	10/18/2016 4:36 PM

Case Narrative

WO#: **1610297**
Date: **11/7/2016**

CLIENT: GeoEngineers
Project: Gas Works Park Site

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1610297**
Date Reported: **11/7/2016**

Client: GeoEngineers
Collection Date: 10/18/2016 1:20:00 PM
Project: Gas Works Park Site
Lab ID: 1610297-003
Matrix: Groundwater
Client Sample ID: **PAI-31-S-161018**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15164		Analyst: TN
Arsenic	733	0.500		µg/L	1	10/19/2016 11:30:36 AM
Iron	576	50.0		µg/L	1	10/19/2016 11:30:36 AM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	143	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

Analytical Report

Work Order: **1610297**
Date Reported: **11/7/2016**

Client: GeoEngineers
Collection Date: 10/18/2016 12:45:00 PM
Project: Gas Works Park Site
Lab ID: 1610297-004
Matrix: Groundwater
Client Sample ID: **PAI-31-D-161018**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15164		Analyst: TN
Arsenic	225	0.500		µg/L	1	10/19/2016 10:59:52 AM
Iron	2,690	50.0		µg/L	1	10/19/2016 10:59:52 AM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	26.7	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

Analytical Report

Work Order: **1610297**
Date Reported: **11/7/2016**

Client: GeoEngineers
Collection Date: 10/18/2016 4:12:00 PM
Project: Gas Works Park Site
Lab ID: 1610297-007
Matrix: Groundwater
Client Sample ID: **PAI-32-D-161018**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15164		Analyst: TN
Arsenic	471	0.500		µg/L	1	10/19/2016 11:21:11 AM
Iron	3,640	50.0		µg/L	1	10/19/2016 11:21:11 AM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	77.0	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

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Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers
Lab Project #: 1610297

Percent Finer (Passing) than the Indicated Size

UOM = Percent

Grain Size Classification	*Gravel*						*Coarse Sand*	*Medium Sand*		*Fine Sand*			*Silt*		
Sieve Size	**3"**	**2"**	**1 1/2"**	**1"**	**3/4"**	**3/8"**	**#4**	**#10**	**#20**	**#40**	**#60**	**#140**	**#200**	**#325**	**#450**
Particle Size (Microns)	**76200**	**50800**	**38100**	**25400**	**19050**	**9525**	**4750**	**2000**	**850**	**425**	**250**	**106**	**75**	**45**	**34**
PAI-31-15-16.5	100%	100%	100%	100%	82.7%	69.0%	58.4%	51.0%	44.5%	35.4%	24.2%	9.41%	3.84%	0.674%	0.196%
PAI-31-27-29.5	100%	100%	100%	100%	98.8%	90.8%	86.7%	81.8%	77.3%	70.1%	55.5%	22.5%	10.4%	1.76%	0.389%
PAI-32-23.4-26	100%	100%	100%	100%	95.8%	87.9%	80.8%	71.0%	63.3%	54.1%	40.0%	16.8%	7.82%	1.93%	0.615%
PAI-32-21-23.4	100%	100%	100%	100%	97.0%	92.4%	88.1%	80.6%	72.9%	62.6%	46.1%	14.4%	3.98%	0.480%	0.0811%

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Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers
Lab Project #: 1610297

Percent Retained in Each Size Fraction

UOM = Percent

Grain Size Classification	*Gravel*							*Coarse Sand*	*Medium Sand*		*Fine Sand*			*Silt*		
Sieve Size (Microns)	**>76200**	**76200-50800**	**50800-38100**	**38100-25400**	**25400-19000**	**19050-9525**	**9525-4750**	**4750-2000**	**2000-850**	**850-425**	**425-250**	**250-106**	**106-75**	**75-45**	**45-34**	**<34**
PAI-31-15-16.5	0.00%	0.00%	0.00%	0.00%	17.3%	13.7%	10.6%	7.41%	6.53%	9.02%	11.2%	14.8%	5.56%	3.17%	0.477%	0.196%
PAI-31-27-29.5	0.00%	0.00%	0.00%	0.00%	1.19%	8.01%	4.04%	4.98%	4.46%	7.14%	14.6%	33.0%	12.1%	8.63%	1.37%	0.388%
PAI-32-23.4-26	0.00%	0.00%	0.00%	0.00%	4.21%	7.91%	7.08%	9.73%	7.67%	9.24%	14.0%	23.2%	8.94%	5.88%	1.31%	0.614%
PAI-32-21-23.4	0.00%	0.00%	0.00%	0.00%	3.04%	4.53%	4.33%	7.52%	7.67%	10.3%	16.5%	31.6%	10.4%	3.49%	0.399%	0.0810%

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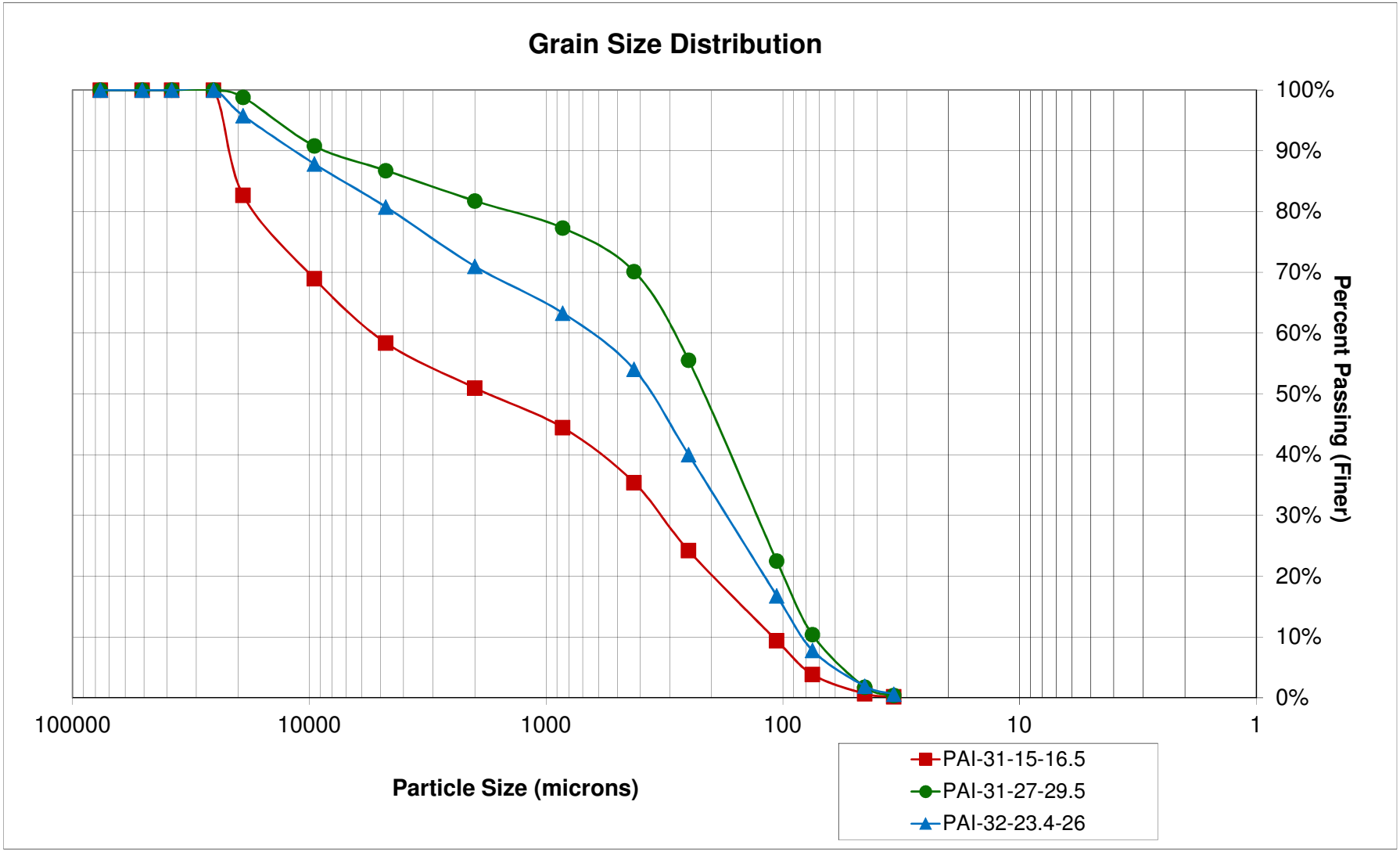
Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers
Lab Project #: 1610297



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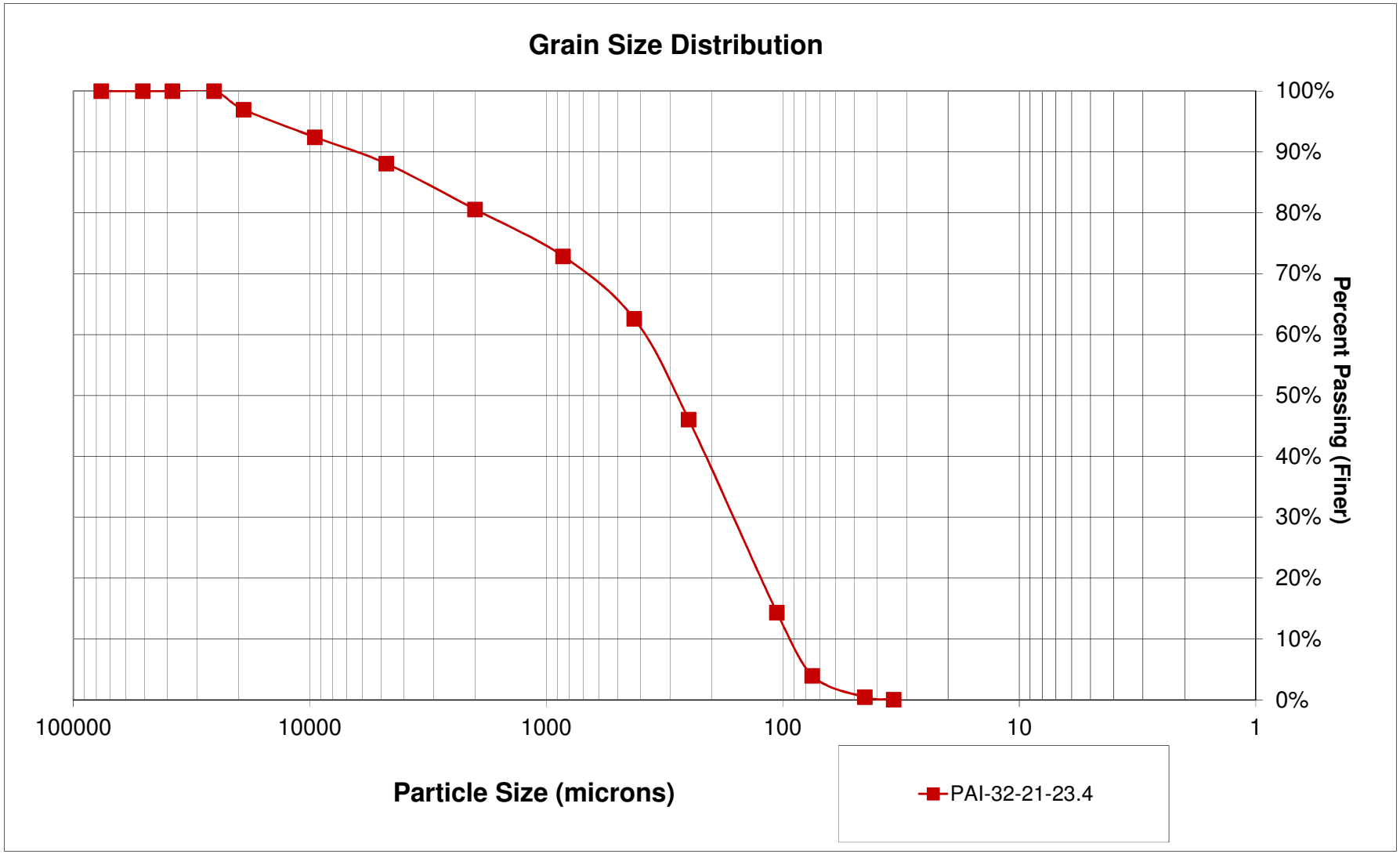
Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers
Lab Project #: 1610297



A S Environmental
A S roup SA, orp
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elso, WA 98626
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www.alsglobal.com

ovember 04, 2016 **Analytical Report for Service Request No:** 1612824

Mr. Michael Ridgeway
Fremont Analytical
3600 Fremont Avenue, orth
Seattle, WA 98103

RE: 1610297

ear Mr.Ridgeway,

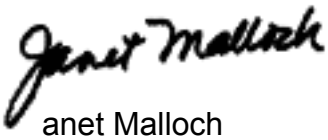
Enclosed are the results of the sample(s) submitted to our laboratory October 21, 2016
For your reference, these analyses have been assigned our service re uest number **K1612824.**

Analyses were performed according to our laboratory's E AP-approved uality assurance program. The test results meet re uirements of the current E AP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of E AP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and A S roup SA orp. dba A S Environmental (A S) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analy ed, as listed in the report.

Please contact me if you have any uestions. My extension is 3375. ou may also contact me via email at anet.Malloch@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



anet Malloch
Pro ect Manager

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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Chain of Custody

ALS Environmental—Kelso Laboratory
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CHAIN OF CUSTODY RECORD

Omega COCID 293	PAGE: 1	OF: 1

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FAX: 206-352-7178
Website: www.fremontanalytical.com

1610128324

SUB CONTRATOR: **ALS** COMPANY: **ALS Environmental**	SPECIAL INSTRUCTIONS / COMMENTS:
ADDRESS: **1317 South 13th Avenue**	Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.
CITY, STATE, ZIP: **Kelso, WA 98626**	
PHONE: **(360) 577-7222** FAX: EMAIL:	
ACCOUNT #:	

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1610297-001B	PAI-31-15-16.5	CLEAR JARS 4 O	Soil	10/18/2016 10:40:00 AM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						
2	1610297-002B	PAI-31-27-29.5	CLEAR JARS 4 O	Soil	10/18/2016 11:00:00 AM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						
3	1610297-005B	PAI-32-23.4-26	CLEAR JARS 4 O	Soil	10/18/2016 3:25:00 PM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						
4	1610297-006B	PAI-32-21-23.4	CLEAR JARS 4 O	Soil	10/18/2016 3:25:00 PM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						

Relinquished By:	Date: 10/20/16	Time: 1443	Received By:	Date: 10/21/16	Time: 0915 0845
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☑ RUSH Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☒ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

PC Janet

Cooler Receipt and Preservation Form

Client Fremont Service Request K16 12824

Received: 10/21/16 Opened: 10/21/16 By: KO Unloaded: 10/21/16 By: KO

1. Samples were received via? *USPS* *Fed Ex* *(UPS)* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *(Cooler)* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number NA	Filed
1.8	1.9	—	—	+.1	356		1ZX61 92X 03 3275 7014	

4. Packing material: *Inserts* *Baggies* *(Bubble Wrap)* *(Gel Packs)* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Votes, Discrepancies, & Resolutions: _____

Total Solids

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	Fremont Analytical	**Service Request:**	K1612824
Project:	1610297	**Date Collected:**	10/18/16
Sample Matrix:	Soil	**Date Received:**	10/21/16
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
1610297-001B PAI-31-15-16.5	K1612824-001	**89.4**	-	-	1	11/02/16 15:29	
1610297-002B PAI-31-27-29.5	K1612824-002	**92.2**	-	-	1	11/02/16 15:29	
1610297-005B PAI-32-23.4-26	K1612824-003	**93.8**	-	-	1	11/02/16 15:29	
1610297-006B PAI-32-21-23.4	K1612824-004	**80.9**	-	-	1	11/02/16 15:29	

QA/QC Report

Client:	Fremont Analytical	**Service Request:**	K1612824
Project	1610297	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Replicate Sample Summary
Inorganic Parameters

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1608423-007DUP	-	90.2	89.9	90.1	<1	20	11/02/16
Batch QC	K1612846-001DUP	-	39.5	39.8	39.7	<1	20	11/02/16

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Analytical Report

Client:	Fremont Analytical	**Service Request:**	K1612824
Project:	1610297	**Date Collected:**	10/18/16
Sample Matrix:	Soil	**Date Received:**	10/21/16
Analysis Method:	SM 5220 C Modified	**Units:**	mg/Kg
Prep Method:	ALS SOP	**Basis:**	Dry

Chemical Oxygen Demand (COD)

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1610297-001B PAI-31-15-16.5	K1612824-001	**9850**	200	-	1	10/27/16	10/27/16	
1610297-002B PAI-31-27-29.5	K1612824-002	**2140**	190	-	1	10/27/16	10/27/16	
1610297-005B PAI-32-23.4-26	K1612824-003	**2260**	190	-	1	10/27/16	10/27/16	
1610297-006B PAI-32-21-23.4	K1612824-004	**1640**	120	-	1	10/27/16	10/27/16	
Method Blank	K1612824-MB	ND U	10	-	1	10/27/16	10/27/16	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	Fremont Analytical	**Service Request:**	K1612824
Project	1610297	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
		Date Analyzed:	10/27/16

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	Batch QC	**Units:**	mg/Kg
Lab Code:	K1612822-001	**Basis:**	Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1612822-001DUP Result	Average	RPD	RPD Limit
Chemical Oxygen Demand (COD)	SM 5220 C Modified	170	-	19200	22000	20600	14	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Fremont Analytical	**Service Request:**	K1612824
Project:	1610297	**Date Collected:**	N/A
Sample Matrix:	Soil	**Date Received:**	N/A
		Date Analyzed:	10/27/16
		Date Extracted:	10/27/16

Matrix Spike Summary
Chemical Oxygen Demand (COD)

Sample Name:	Batch QC	**Units:**	mg/Kg
Lab Code:	K1612822-001	**Basis:**	Dry
Analysis Method:	SM 5220 C Modified		
Prep Method:	ALS SOP		

Matrix Spike
K1612822-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Chemical Oxygen Demand (COD)	19200	31100	10000	119	75-125

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Fremont Analytical	**Service Request:**	K1612824
Project:	1610297	**Date Analyzed:**	10/27/16
Sample Matrix:	Soil	**Date Extracted:**	10/27/16

Lab Control Sample Summary
Chemical Oxygen Demand (COD)

Analysis Method:	SM 5220 C Modified	**Units:**	mg/Kg
Prep Method:	ALS SOP	**Basis:**	Dry
		Analysis Lot:	520929

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1612824-LCS	226	242	93	85-115

Work Order: 1610297
CLIENT: GeoEngineers
Project: Gas Works Park Site

QC SUMMARY REPORT

Chemical Oxygen Demand by SM 5220D

Sample ID	MB-R32441	SampType:	MBLK			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	MBLKW	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613971	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		ND	10.0									

Sample ID	LCS-R32441	SampType:	LCS			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	LCSW	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613972	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		73.6	10.0	75.00	0	98.1	80	120				

Sample ID	1610288-001ADUP	SampType:	DUP			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	BATCH	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613974	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		46.4	10.0						42.47	8.93	30	

Sample ID	1610288-001AMS	SampType:	MS			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	BATCH	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613975	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		118	10.0	75.00	42.47	101	70	130				

Sample ID	1610288-001AMSD	SampType:	MSD			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	BATCH	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613976	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		114	10.0	75.00	42.47	95.3	70	130	117.9	3.43	30	

Work Order: 1610297
CLIENT: GeoEngineers
Project: Gas Works Park Site

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID	**MB-15164**	SampType:	**MBLK**			Units:	**µg/L**		Prep Date:	**10/19/2016**		RunNo:	**32411**	
Client ID:	**MBLKW**	Batch ID:	**15164**						Analysis Date:	**10/19/2016**		SeqNo:	**613186**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Arsenic		ND	0.500											
Iron		ND	50.0											

Sample ID	**LCS-15164**	SampType:	**LCS**			Units:	**µg/L**		Prep Date:	**10/19/2016**		RunNo:	**32411**	
Client ID:	**LCSW**	Batch ID:	**15164**						Analysis Date:	**10/19/2016**		SeqNo:	**613187**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Arsenic		100	0.500	100.0	0	100	85	115						
Iron		1,020	50.0	1,000	0	102	50	150						

Sample ID	**1610297-004ADUP**	SampType:	**DUP**			Units:	**µg/L**		Prep Date:	**10/19/2016**		RunNo:	**32411**	
Client ID:	**PAI-31-D-161018**	Batch ID:	**15164**						Analysis Date:	**10/19/2016**		SeqNo:	**613189**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Arsenic		233	0.500						224.8	3.50	30			
Iron		2,780	50.0						2,693	3.03	30			

Sample ID	**1610297-004AMS**	SampType:	**MS**			Units:	**µg/L**		Prep Date:	**10/19/2016**		RunNo:	**32411**	
Client ID:	**PAI-31-D-161018**	Batch ID:	**15164**						Analysis Date:	**10/19/2016**		SeqNo:	**613190**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Arsenic		808	0.500	500.0	224.8	117	70	130						
Iron		8,340	50.0	5,000	2,693	113	50	150						

Sample ID	**1610297-004AMSD**	SampType:	**MSD**			Units:	**µg/L**		Prep Date:	**10/19/2016**		RunNo:	**32411**	
Client ID:	**PAI-31-D-161018**	Batch ID:	**15164**						Analysis Date:	**10/19/2016**		SeqNo:	**613193**	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual		
Arsenic		797	0.500	500.0	224.8	114	70	130	807.8	1.40	30			

Work Order: 1610297
CLIENT: GeoEngineers
Project: Gas Works Park Site

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID **1610297-004AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **10/19/2016** RunNo: **32411**
Client ID: **PAI-31-D-161018** Batch ID: **15164** Analysis Date: **10/19/2016** SeqNo: **613193**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	7,930	50.0	5,000	2,693	105	50	150	8,342	5.00	30	

Sample Log-In Check List

Client Name:	**GEI**	Work Order Number:	**1610297**
Logged by:	**Erica Silva**	Date Received:	**10/18/2016 4:36:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	0.9
Sample	1.2
Temp Blank	2.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical

Chain of Custody Record and Laboratory Services Agreement

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/18/2016

Laboratory Project No (internal): 1610297

Page: 1 of: 1

Client: GeoEngineers
Address: 600 Stewart Street, Suite 1700
City, State, Zip: Seattle, WA 98103
Telephone: 253.722.2418 Fax:

Project Name: Gas Works Park Site
Project No: 0186-846-01 Task 1803 Collected by: MWB/CVD
Location: Seattle
Report To (PM): Sandra Smith / Claudia De La Via
PM Email: sbsmith@geoengineers.com cdelavia@geoengineers.com

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Arsenic (EPA 200.8) field filtered	Iron (EPA 200.8) field filtered	COD (SM5220D) field filtered	COD (SM5220)	Grain Size (ASTM D422)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Comments
1 PAI-31-15-16.5	10/18	1040	S				X	X					
2 PAI-31-27-29.5		1100	S				X	X					
3 PAI-31-S-161018		1320	GW	X	X	X							
4 PAI-31-D-161018		1245	GW	X	X	X							
5 PAI-32-23.4-26		1525	S				X	X					
6 PAI-32-21-23.4		1525	S				X	X					
7 PAI-32-D-161018		1612	GW	X	X	X							
8 PAI-													
9 PAI-													
10 PAI-													

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:
1. Groundwater arsenic and sulfide samples on ASAP TAT.
2. Groundwater iron and COD plus soil COD and grain size samples on standard TAT.
3. Groundwater and soil RLs per the WO
4. COD = Chemical oxygen demand
5. Run for dissolved metals

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	10/18/16 1626	x	10/18/16 1626
x	10/18/16 1636	x	10/18/16 1636

TAT → SameDay^ NextDay^ 2 Day 3 Day STD

^Please coordinate with the lab in advance

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

GeoEngineers
Sandra Smith
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Gas Works Park Site
Work Order Number: 1610317

November 11, 2016

Attention Sandra Smith:

Fremont Analytical, Inc. received 7 sample(s) on 10/19/2016 for the analyses presented in the following report.

Chemical Oxygen Demand by SM 5220D
Dissolved Metals by EPA Method 200.8
Grain Size by ASTM D422

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

CC:
Claudia De La Via

Date: *11/11/2016*

CLIENT: GeoEngineers
Project: Gas Works Park Site
Work Order: 1610317

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1610317-001	PAI-33-11.5-12.5	10/19/2016 10:55 AM	10/19/2016 4:31 PM
1610317-002	PAI-33-12.5-15	10/19/2016 10:50 AM	10/19/2016 4:31 PM
1610317-003	PAI-33-25-30	10/19/2016 11:50 AM	10/19/2016 4:31 PM
1610317-004	PAI-33-D-161019	10/19/2016 12:55 PM	10/19/2016 4:31 PM
1610317-005	PAI-33-S-161019	10/19/2016 2:10 PM	10/19/2016 4:31 PM
1610317-006	DUP-161019	10/19/2016 12:00 AM	10/19/2016 4:31 PM
1610317-007	PAI-33-M-161019	10/19/2016 3:10 PM	10/19/2016 4:31 PM

Case Narrative

WO#: **1610317**
Date: **11/11/2016**

CLIENT: GeoEngineers
Project: Gas Works Park Site

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.
1610317-001B
TEST_SUB has been Sub Contracted.
1610317-002B
TEST_SUB has been Sub Contracted.
1610317-003B
TEST_SUB has been Sub Contracted.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1610317**
Date Reported: **11/11/2016**

Client: GeoEngineers
Collection Date: 10/19/2016 12:55:00 PM
Project: Gas Works Park Site
Lab ID: 1610317-004
Matrix: Groundwater
Client Sample ID: **PAI-33-D-161019**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15183		Analyst: TN
Arsenic	7,560	0.500		µg/L	1	10/20/2016 12:18:00 PM
Iron	1,300	50.0		µg/L	1	10/20/2016 12:18:00 PM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	90.2	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

Analytical Report

Work Order: **1610317**
Date Reported: **11/11/2016**

Client: GeoEngineers
Collection Date: 10/19/2016 2:10:00 PM
Project: Gas Works Park Site
Lab ID: 1610317-005
Matrix: Groundwater
Client Sample ID: **PAI-33-S-161019**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15183		Analyst: TN
Arsenic	3,890	5.00	D	µg/L	10	10/20/2016 12:21:33 PM
Iron	15,600	500	D	µg/L	10	10/20/2016 12:21:33 PM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	78.3	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

Analytical Report

Work Order: **1610317**
Date Reported: **11/11/2016**

Client: GeoEngineers
Project: Gas Works Park Site
Lab ID: 1610317-006
Client Sample ID: **DUP-161019**

Collection Date: 10/19/2016
Matrix: Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15183		Analyst: TN
Arsenic	7,210	5.00	D	µg/L	10	10/20/2016 12:25:05 PM
Iron	1,390	500	D	µg/L	10	10/20/2016 12:25:05 PM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	79.6	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

Analytical Report

Work Order: **1610317**
Date Reported: **11/11/2016**

Client: GeoEngineers
Collection Date: 10/19/2016 3:10:00 PM
Project: Gas Works Park Site
Lab ID: 1610317-007
Matrix: Groundwater
Client Sample ID: **PAI-33-M-161019**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 15183		Analyst: TN
Arsenic	3,870	5.00	D	µg/L	10	10/20/2016 12:28:38 PM
Iron	2,010	500	D	µg/L	10	10/20/2016 12:28:38 PM
Chemical Oxygen Demand by SM 5220D				Batch ID: R32441		Analyst: MW
Chemical Oxygen Demand	179	20.0	D	mg/L	2	10/20/2016 1:28:05 PM

3600 Fremont Ave. N
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Email: info@fremontanalytical.com

Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers GEI
Lab Project #: 1610317

Percent Finer (Passing) than the Indicated Size

UOM = Percent

Grain Size Classification	*Gravel*						*Coarse Sand*	*Medium Sand*		*Fine Sand*			*Silt*		
Sieve Size	**3"**	**2"**	**1 1/2"**	**1"**	**3/4"**	**3/8"**	**#4**	**#10**	**#20**	**#40**	**#60**	**#140**	**#200**	**#325**	**#450**
Particle Size (Microns)	**76200**	**50800**	**38100**	**25400**	**19050**	**9525**	**4750**	**2000**	**850**	**425**	**250**	**106**	**75**	**45**	**34**
PAI-33-11.5-12.5	100%	100%	100%	100%	74.6%	61.8%	52.0%	43.8%	36.9%	27.1%	19.1%	8.72%	5.76%	3.09%	0.887%
PAI-33-12.5-15	100%	100%	100%	100%	81.9%	69.2%	59.7%	48.0%	38.1%	27.6%	17.7%	7.88%	4.98%	1.73%	0.169%
PAI-33-25-30	100%	100%	100%	100%	96.5%	88.3%	80.2%	74.1%	68.8%	60.9%	46.2%	14.1%	5.62%	0.700%	0.0818%

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Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers GEI
Lab Project #: 1610317

Percent Retained in Each Size Fraction

UOM = Percent

Grain Size Classification	*Gravel*							*Coarse Sand*	*Medium Sand*		*Fine Sand*			*Silt*		
Sieve Size (Microns)	**>76200**	**76200-50800**	**50800-38100**	**38100-25400**	**25400-19000**	**19050-9525**	**9525-4750**	**4750-2000**	**2000-850**	**850-425**	**425-250**	**250-106**	**106-75**	**75-45**	**45-34**	**<34**
PAI-33-11.5-12.5	0.00%	0.00%	0.00%	0.00%	25.3%	12.8%	9.76%	8.22%	6.94%	9.72%	8.01%	10.4%	2.95%	2.67%	2.20%	0.886%
PAI-33-12.5-15	0.00%	0.00%	0.00%	0.00%	18.1%	12.7%	9.47%	11.66%	9.90%	10.5%	9.89%	9.78%	2.90%	3.24%	1.56%	0.169%
PAI-33-25-30	0.00%	0.00%	0.00%	0.00%	3.45%	8.17%	8.08%	6.13%	5.24%	7.89%	14.6%	32.0%	8.48%	4.90%	0.62%	0.0815%

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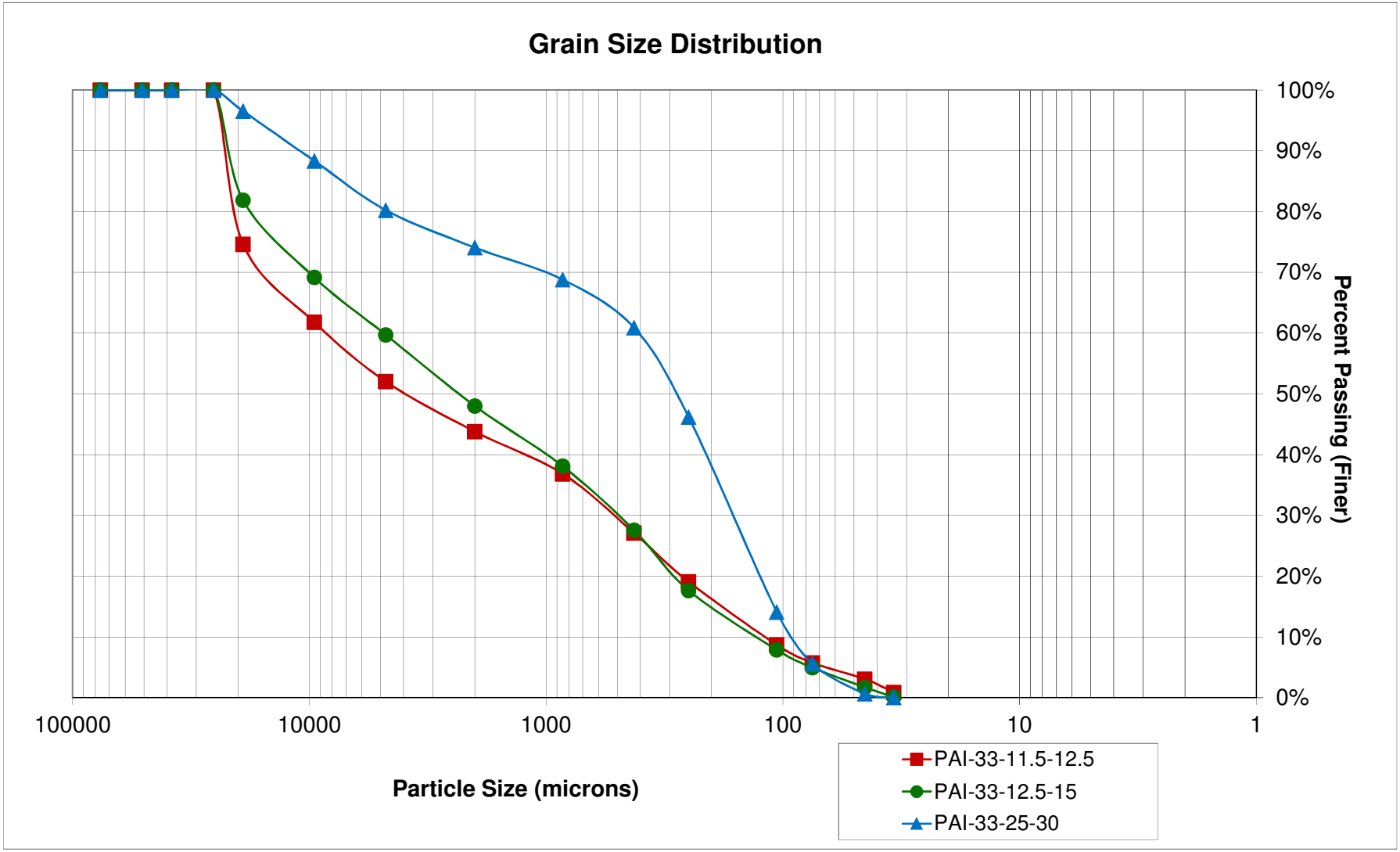
Grain Size by ASTM D422

Project: Gas Works Park Site
Client: GeoEngineers GEI
Lab Project #: 1610317



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ovember 04, 2016 **Analytical Report for Service Request No:** 1612822

Mr. Michael Ridgeway
Fremont Analytical
3600 Fremont Avenue, orth
Seattle, WA 98103

RE: 1610317

ear Mr.Ridgeway,

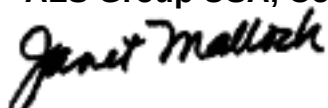
Enclosed are the results of the sample(s) submitted to our laboratory October 21, 2016
For your reference, these analyses have been assigned our service re uest number **K1612822.**

Analyses were performed according to our laboratory's E AP-approved uality assurance program. The test results meet re uirements of the current E AP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of E AP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and A S roup SA orp. dba A S Environmental (A S) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analy ed, as listed in the report.

Please contact me if you have any uestions. My extension is 3375. ou may also contact me via email at anet.Malloch@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental



anet Malloch
Pro ect Manager

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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Chain of Custody

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CHAIN OF CUSTODY RECORD

Omega COCID 294 | PAGE: 1 | OF: 1

ADDRESS
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3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178
Website: www.fremontanalytical.com

K1610317822

SUB CONTRATOR: **ALS** COMPANY: **ALS Environmental**

ADDRESS: **1317 South 13th Avenue**

CITY, STATE, ZIP: **Kelso, WA 98626**

PHONE: **(360) 577-7222** FAX: EMAIL:

ACCOUNT #:

SPECIAL INSTRUCTIONS / COMMENTS:

Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1610317-001B	PAI-33-11.5-12.5	CLEAR JARS 4 O	Soil	10/19/2016 10:55:00 AM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						
2	1610317-002B	PAI-33-12.5-15	CLEAR JARS 4 O	Soil	10/19/2016 10:50:00 AM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						
3	1610317-003B	PAI-33-25-30	CLEAR JARS 4 O	Soil	10/19/2016 11:50:00 AM	1	Chemical Oxygen Demand by SM5220, Low Level RL
	TEST_SUB						

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
	10/20/16	1443		10/21/16	0915
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard ☑ **RUSH** Next BD ☐ 2nd BD ☐ 3rd BD ☐

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

☐ HARDCOPY (extra cost) ☐ FAX ☑ EMAIL ☐ ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool ? _____

Comments: _____

ALS

PC Janet

Cooler Receipt and Preservation Form

Client Fremont Service Request K16/2822

Received: 10/21/16 Opened: 10/21/16 By: KO Unloaded: 10/21/16 By: KO

1. Samples were received via? *USPS* *Fed Ex* *(UPS)* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *(Cooler)* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y *(N)* If yes, how many and where? _____

If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number NA	Filed
1.8	1.9	—	—	+.1	356		1ZX619 2X03 3275	Y

4. Packing material: *Inserts* *Baggies* *(Bubble Wrap)* *(Gel Packs)* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA *(Y)* N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA *(Y)* N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA *(Y)* N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA *(Y)* N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA *(Y)* N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* *(NA)* Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* *(NA)* Y N
12. Was C12/Res negative? *(NA)* Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Total Solids

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Analytical Report

Client:	Fremont Analytical	**Service Request:**	K1612822
Project:	1610317	**Date Collected:**	10/19/16
Sample Matrix:	Soil	**Date Received:**	10/21/16
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
1610317-001B PAI-33-11.5-12.5	K1612822-001	**79.7**	-	-	1	11/02/16 15:29	
1610317-002B PAI-33-12.5-15	K1612822-002	**70.9**	-	-	1	11/02/16 15:29	
1610317-003B PAI-33-25-30	K1612822-003	**89.2**	-	-	1	11/02/16 15:29	

QA/QC Report

Client:	Fremont Analytical	**Service Request:**	K1612822
Project	1610317	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Replicate Sample Summary
Inorganic Parameters

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1608423-007DUP	-	90.2	89.9	90.1	<1	20	11/02/16
Batch QC	K1612846-001DUP	-	39.5	39.8	39.7	<1	20	11/02/16

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

General Chemistry

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www.alsglobal.com

Analytical Report

Client:	Fremont Analytical	**Service Request:**	K1612822
Project:	1610317	**Date Collected:**	10/19/16
Sample Matrix:	Soil	**Date Received:**	10/21/16
Analysis Method:	SM 5220 C Modified	**Units:**	mg/Kg
Prep Method:	ALS SOP	**Basis:**	Dry

Chemical Oxygen Demand (COD)

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1610317-001B PAI-33-11.5-12.5	K1612822-001	**19200**	130	-	1	10/27/16	10/27/16	
1610317-002B PAI-33-12.5-15	K1612822-002	**107000**	580	-	1	10/27/16	10/27/16	
1610317-003B PAI-33-25-30	K1612822-003	**1650**	170	-	1	10/27/16	10/27/16	
Method Blank	K1612822-MB	ND U	10	-	1	10/27/16	10/27/16	

Client:	Fremont Analytical	**Service Request:**	K1612822
Project	1610317	**Date Collected:**	10/19/16
Sample Matrix:	Soil	**Date Received:**	10/21/16
		Date Analyzed:	10/27/16

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	1610317-001B PAI-33-11.5-12.5	**Units:**	mg/Kg
Lab Code:	K1612822-001	**Basis:**	Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1612822-001DUP Result	Average	RPD	RPD Limit
Chemical Oxygen Demand (COD)	SM 5220 C Modified	170	-	19200	22000	20600	14	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Fremont Analytical	**Service Request:**	K1612822
Project:	1610317	**Date Collected:**	10/19/16
Sample Matrix:	Soil	**Date Received:**	10/21/16
		Date Analyzed:	10/27/16
		Date Extracted:	10/27/16

Matrix Spike Summary
Chemical Oxygen Demand (COD)

Sample Name:	1610317-001B PAI-33-11.5-12.5	**Units:**	mg/Kg
Lab Code:	K1612822-001	**Basis:**	Dry
Analysis Method:	SM 5220 C Modified		
Prep Method:	ALS SOP		

Matrix Spike
K1612822-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Chemical Oxygen Demand (COD)	19200	31100	10000	119	75-125

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	Fremont Analytical	**Service Request:**	K1612822
Project:	1610317	**Date Analyzed:**	10/27/16
Sample Matrix:	Soil	**Date Extracted:**	10/27/16

Lab Control Sample Summary
Chemical Oxygen Demand (COD)

Analysis Method:	SM 5220 C Modified	**Units:**	mg/Kg
Prep Method:	ALS SOP	**Basis:**	Dry
		Analysis Lot:	520929

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1612822-LCS	226	242	93	85-115

Work Order: 1610317
CLIENT: GeoEngineers
Project: Gas Works Park Site

QC SUMMARY REPORT

Chemical Oxygen Demand by SM 5220D

Sample ID	MB-R32441	SampType:	MBLK			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	MBLKW	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613971	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		ND	10.0									

Sample ID	LCS-R32441	SampType:	LCS			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	LCSW	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613972	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		73.6	10.0	75.00	0	98.1	80	120				

Sample ID	1610288-001ADUP	SampType:	DUP			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	BATCH	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613974	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		46.4	10.0						42.47	8.93	30	

Sample ID	1610288-001AMS	SampType:	MS			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	BATCH	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613975	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		118	10.0	75.00	42.47	101	70	130				

Sample ID	1610288-001AMSD	SampType:	MSD			Units:	mg/L	Prep Date:	10/20/2016	RunNo:	32441	
Client ID:	BATCH	Batch ID:	R32441					Analysis Date:	10/20/2016	SeqNo:	613976	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chemical Oxygen Demand		114	10.0	75.00	42.47	95.3	70	130	117.9	3.43	30	

Work Order: 1610317
CLIENT: GeoEngineers
Project: Gas Works Park Site

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID	**MB-15183**	SampType:	**MBLK**			Units:	**µg/L**	Prep Date:	**10/20/2016**	RunNo:	**32437**
Client ID:	**MBLKW**	Batch ID:	**15183**					Analysis Date:	**10/20/2016**	SeqNo:	**613946**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.500									
Iron	ND	50.0									

Sample ID	**MB-15178FB**	SampType:	**MBLK**			Units:	**µg/L**	Prep Date:	**10/20/2016**	RunNo:	**32437**
Client ID:	**MBLKW**	Batch ID:	**15183**					Analysis Date:	**10/20/2016**	SeqNo:	**613947**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.500									
Iron	ND	50.0									

NOTES:
Filter Blank

Sample ID	**LCS-15183**	SampType:	**LCS**			Units:	**µg/L**	Prep Date:	**10/20/2016**	RunNo:	**32437**
Client ID:	**LCSW**	Batch ID:	**15183**					Analysis Date:	**10/20/2016**	SeqNo:	**613948**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	98.6	0.500	100.0	0	98.6	85	115				
Iron	1,010	50.0	1,000	0	101	50	150				

Sample ID	**1610263-001BDUP**	SampType:	**DUP**			Units:	**µg/L**	Prep Date:	**10/20/2016**	RunNo:	**32437**
Client ID:	**BATCH**	Batch ID:	**15183**					Analysis Date:	**10/20/2016**	SeqNo:	**613952**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.500						0		30	
Iron	153	50.0						146.3	4.64	30	

Work Order: 1610317
CLIENT: GeoEngineers
Project: Gas Works Park Site

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID **1610263-001BMS** SampType: **MS** Units: **µg/L** Prep Date: **10/20/2016** RunNo: **32437**
Client ID: **BATCH** Batch ID: **15183** Analysis Date: **10/20/2016** SeqNo: **613953**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	502	0.500	500.0	0.09350	100	70	130				
Iron	5,200	50.0	5,000	146.3	101	50	150				

Sample ID **1610263-001BMSD** SampType: **MSD** Units: **µg/L** Prep Date: **10/20/2016** RunNo: **32437**
Client ID: **BATCH** Batch ID: **15183** Analysis Date: **10/20/2016** SeqNo: **613954**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	505	0.500	500.0	0.09350	101	70	130	502.1	0.544	30	
Iron	5,170	50.0	5,000	146.3	100	50	150	5,200	0.561	30	

Sample Log-In Check List

Client Name:	**GEI**	Work Order Number:	**1610317**
Logged by:	**Erica Silva**	Date Received:	**10/19/2016 4:31:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler 1	7.3
Cooler 2	2.1
Sample 1	4.8
Sample 2	1.9
Temp Blank	3.4

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Sample Log-In Check List

Client Name:	**GEI**	Work Order Number:	**1610317**
Logged by:	**Erica Silva**	Date Received:	**10/19/2016 4:31:00 PM**

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical

Chain of Custody Record and Laboratory Services Agreement

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/19/2016

Laboratory Project No (internal): 1610317

Page: 1 of: 1

Client: GeoEngineers
Address: 600 Stewart Street, Suite 1700
City, State, Zip: Seattle, WA 98103
Telephone: 253.722.2418 Fax:

Project Name: Gas Works Park Site
Project No: 0186-846-01 Task 1803
Location: Seattle
Report To (PM): Sandra Smith / Claudia De La Via
PM Email: sbsmith@geoengineers.com cdelavia@geoengineers.com
Collected by: MWB/CVD

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	Arsenic (EPA 200.8) field filtered	Iron (EPA 200.8) field filtered	COD (SM5220D) field filtered	COD (SM5220)	Grain Size (ASTM D422)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8) Total (T) | Dissolved (D)	Comments
1 PAI-33-11.5-12.5	10/19	1055	S				X	X					
2 PAI-33-12.5-15		1050	S				X	X					
3 PAI-33-25-30		1150	S				X	X					
4 PAI-33-D-161019		1255	GW	X	X	X							
5 PAI-33-S-161019		1410	GW	X	X	X							
6 ~~PAI-~~ DUP-161019		—	GW	X	X	X							
7 PAI-33-M-161019		1510	GW	X	X	X							
8 PAI-													
9 PAI-													
10 PAI-													

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (Samples will be held for 30 days unless otherwise noted. A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:
1. Groundwater arsenic and sulfide samples on ASAP TAT.
2. Groundwater iron and COD plus soil COD and grain size samples on standard TAT.
3. Groundwater and soil RLs per the WO
4. COD = Chemical oxygen demand
5. Run for dissolved metals

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x	10/19/16 1536	x	10/19/16 1536
x	10/19/16 1631	x	10/19/16 1631

TAT → SameDay^ NextDay^ 2 Day 3 Day STD

^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

Analytical Resources, Incorporated
Analytical Chemists and Consultants

29 September 2016

Claudia DeLaVia
GeoEngineers
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Gas Works Park Site

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
16I0420	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Cheronne Oreiro, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Analytical Report

GeoEngineers	Project: Gas Works Park Site	
600 Stewart Street, Suite 1700	Project Number: 0186-846-01	**Reported:**
Seattle WA, 98101	Project Manager: Claudia DeLaVia	29-Sep-2016 17:51

Case Narrative

Sample receipt

Five water samples were received on September 27, 2016 under ARI workorder 16I0420. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Sulfide - SM4500-S2 D-00

The samples and associated laboratory QC were analyzed within the recommended holding times.

The method blank was clean at the reporting limit. The LCS percent recoveries were within control limits.

The matrix spike percent recovery and duplicate RPD were within limits.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 161420	Turn-around Requested: ASAP	Page: 1 of 1	
ARI Client Company: GeoEngineers	Phone:	Date: 9/26/2016	Ice Present? Yes
Client Contact: CLAUDIA DeLaVia / SANDRA SMITH		No. of Coolers: 1	Cooler Temps: 2.6
Client Project Name: GAS WORKS PARK SITE			
Client Project #: 0186-846-01	Samplers: BRIAN ANDERSON		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: SULFIDE	Notes/Comments
D-160926	9-26-16	—	W	1	4	FIELD FILTERED
PAI-23-S-160926	9-26-16	1156	W	1	4	" "
PAI-23-D-160926	9-26-16	1108	W	1	4	" "
PAI-24-S-160926	9-26-16	1700	W	1	4	" "
PAI-24-D-160926	9-26-16	1602	W	1	4	FIELD FILTERED

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Claudia De La Via	Printed Name: Brian Warren	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 9/26/16 1215	Date & Time: 9.27.16 1215	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineers

Project Name: Gas Works Park Site

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 16I0420

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 2.7 3.3 3.6 4.2 2.6 ____

Time: 1325

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005270

Cooler Accepted by: _____ Date: 9.27.16 Time: 1215

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	_____	

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

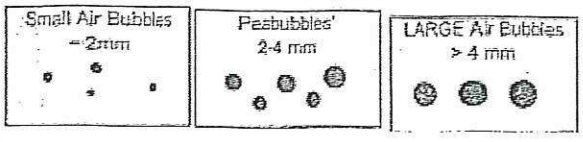
Samples Logged by: JM Date: 9-27-16 Time: 1337

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)	
Peabubbles → "pb" (2 to < 4 mm)	
Large → "lg" (4 to < 6 mm)	
Headspace → "hs" (> 6 mm)	

WORK ORDER

16I0420

Client: GeoEngineers | **Project Manager:** Cheronne Oreiro

Project: Gas Works Park Site | **Project Number:** 0186-846-01

Preservation Confirmation

Container ID	Container Type		pH
16I0420-01 A	Small OJ, 500 mL	< 9	fail
16I0420-02 A	Small OJ, 500 mL	< 9	fail
16I0420-03 A	Small OJ, 500 mL	< 9	fail
16I0420-04 A	Small OJ, 500 mL	< 9	fail
16I0420-05 A	Small OJ, 500 mL	< 9	fail

JM
Preservation Confirmed By

9-27-16
Date

JM
Reviewed By

9-27-16
Date

GeoEngineers	Project:	Gas Works Park Site	
600 Stewart Street, Suite 1700	Project Number:	0186-846-01	**Reported:**
Seattle, WA 98101	Project Manager:	Claudia DeLaVia	09/29/2016 17:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
D-160926	16I0420-01	Water	09/26/16 00:00	09/27/16 12:15
PAI-23-D-160926	16I0420-03	Water	09/26/16 11:08	09/27/16 12:15
PAI-23-S-160926	16I0420-02	Water	09/26/16 11:56	09/27/16 12:15
PAI-24-D-160926	16I0420-05	Water	09/26/16 16:02	09/27/16 12:15
PAI-24-S-160926	16I0420-04	Water	09/26/16 17:00	09/27/16 12:15

Analytical Resources, Incorporated

Internal Chain of Custody

Client:	GeoEngineers	Received:	27-Sep-2016 12:15
Project:	Gas Works Park Site	Received By:	Justin Meyer
Number:	0186-846-01	Temp (°C):	2.60

16I0420-01 (D-160926) Sampled 09/26/2016 00:00

Current Status	*Out*	*Location*	*In*
16I0420-01 A [Small OJ, 500 mL]			*Hazard Info:*
Sample Receiving	09/27/2016 13:43 by JEM	***START***	09/27/2016 13:43 by JEM
Conventionals	09/27/2016 14:23 by NN	R-33 E	09/27/2016 17:01 by NN

16I0420-02 (PAI-23-S-160926) Sampled 09/26/2016 11:56

Current Status	*Out*	*Location*	*In*
16I0420-02 A [Small OJ, 500 mL]			*Hazard Info:*
Sample Receiving	09/27/2016 13:44 by JEM	***START***	09/27/2016 13:44 by JEM
Conventionals	09/27/2016 14:23 by NN	R-33 E	09/27/2016 17:01 by NN

16I0420-03 (PAI-23-D-160926) Sampled 09/26/2016 11:08

Current Status	*Out*	*Location*	*In*
16I0420-03 A [Small OJ, 500 mL]			*Hazard Info:*
Sample Receiving	09/27/2016 13:44 by JEM	***START***	09/27/2016 13:44 by JEM
Conventionals	09/27/2016 14:23 by NN	R-33 E	09/27/2016 17:01 by NN

16I0420-04 (PAI-24-S-160926) Sampled 09/26/2016 17:00

Current Status	*Out*	*Location*	*In*
16I0420-04 A [Small OJ, 500 mL]			*Hazard Info:*
Sample Receiving	09/27/2016 13:44 by JEM	***START***	09/27/2016 13:44 by JEM
Conventionals	09/27/2016 14:23 by NN	R-33 E	09/27/2016 17:01 by NN

16I0420-05 (PAI-24-D-160926) Sampled 09/26/2016 16:02

Current Status	*Out*	*Location*	*In*
16I0420-05 A [Small OJ, 500 mL]			*Hazard Info:*
Sample Receiving	09/27/2016 13:45 by JEM	***START***	09/27/2016 13:45 by JEM
Conventionals	09/27/2016 14:23 by NN	R-33 E	09/27/2016 17:01 by NN

QUALIFIERS AND NOTES

Qualifier	Definition
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Conventionals Laboratory Analyst Notes

ARI Job No.: 16I0420-01
16I0420-03
16I0420-05

Client ID:

Parameter: S^{2-}

Client Project:

List problems, concerns, corrective actions and any other pertinent information
No headspace to preserve samples - homogenized & removed some sample volume in order to preserve to pH > 9.

Analyst Initials:		Date:	9-27-16

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

D-160926

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0420

Matrix: Ground Water Laboratory ID: 16I0420-01 File ID: 092716NN-003

Sampled: 09/26/16 00:00 Prepared: 09/27/16 16:03 Analyzed: 09/27/16 16:46

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEI0766 Sequence: SEI0426 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.072	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-23-S-160926

SM 4500-S2 D-00
TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0420

Matrix: Ground Water Laboratory ID: 16I0420-02 File ID: 092716NN-006

Sampled: 09/26/16 11:56 Prepared: 09/27/16 16:03 Analyzed: 09/27/16 16:49

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEI0766 Sequence: SEI0426 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.107	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-23-D-160926

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0420

Matrix: Ground Water Laboratory ID: 16I0420-03 File ID: 092716NN-007

Sampled: 09/26/16 11:08 Prepared: 09/27/16 16:03 Analyzed: 09/27/16 16:49

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEI0766 Sequence: SEI0426 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.068	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-24-S-160926

SM 4500-S2 D-00
TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0420

Matrix: Ground Water Laboratory ID: 16I0420-04 File ID: 092716NN-008

Sampled: 09/26/16 17:00 Prepared: 09/27/16 16:03 Analyzed: 09/27/16 16:51

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEI0766 Sequence: SEI0426 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.055	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-24-D-160926

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0420

Matrix: Ground Water Laboratory ID: 16I0420-05 File ID: 092716NN-009

Sampled: 09/26/16 16:02 Prepared: 09/27/16 16:03 Analyzed: 09/27/16 16:51

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEI0766 Sequence: SEI0426 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.065	1	0.030	0.050	

PREPARATION BATCH SUMMARY

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc. SDG: 16I0420

Client: GeoEngineers Project: Gas Works Park Site

Batch: BEI0766 Batch Matrix: Water Preparation: No Prep Wet Chem

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
D-160926	16I0420-01	092716NN-003	09/27/16 16:03	
PAI-23-S-160926	16I0420-02	092716NN-006	09/27/16 16:03	
PAI-23-D-160926	16I0420-03	092716NN-007	09/27/16 16:03	
PAI-24-S-160926	16I0420-04	092716NN-008	09/27/16 16:03	
PAI-24-D-160926	16I0420-05	092716NN-009	09/27/16 16:03	
Blank	BEI0766-BLK1		09/27/16 16:03	
LCS	BEI0766-BS1		09/27/16 16:03	
D-160926	BEI0766-DUP1	092716NN-004	09/27/16 16:03	
D-160926	BEI0766-MS1	092716NN-005	09/27/16 16:03	

Analytical Resources, Incorporated

Form I

METHOD BLANK DATA SHEET

SM 4500-S2 D-00

TotalAnalytes

Blank

Batch: BEI0766 Laboratory ID: BEI0766-BLK1 Prepared: 09/27/16 16:03

Matrix: Water Preparation: No Prep Wet Chem Analyzed: 09/27/16 16:21

Sequence: SEI0426 Calibration: N/A Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	ND	1	0.030	0.050	U

Analytical Resources, Incorporated

DUPLICATES

SM 4500-S2 D-00

D-160926

Laboratory: Analytical Resources, Inc.
SDG: 16I0420
Client: GeoEngineers
Project: Gas Works Park Site
Matrix: Water
Laboratory ID: BEI0766-DUP1
Batch: BEI0766
Lab Source ID: 16I0420-01
Preparation: No Prep Wet Chem
Initial/Final: 5 mL / 5 mL
Source Sample Name: D-160926
% Solids:

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/L)	C	DUPLICATE CONCENTRATION (mg/L)	C	RPD %	Q
Sulfide		0.072		0.071		1.40	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

MS / MS DUPLICATE RECOVERY
SM 4500-S2 D-00

Laboratory:	Analytical Resources, Inc.	SDG:	16I0420
Client:	GeoEngineers	Project:	Gas Works Park Site
Matrix:	Water	Analyzed:	09/27/16 16:47
Batch:	BEI0766	Laboratory ID:	BEI0766-MS1
Preparation:	No Prep Wet Chem	Sequence Name::	Matrix Spike
Initial/Final:	5 mL / 5 mL	Source Sample:	D-160926

COMPOUND	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC. #	QC LIMITS REC.
Sulfide	0.499	0.072	0.523	90.4	75 - 125

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

SM 4500-S2 D-00

Laboratory:	Analytical Resources, Inc.	SDG:	16I0420
Client:	GeoEngineers	Project:	Gas Works Park Site
Matrix:	Water	Analyzed:	09/27/16 16:22
Batch:	BEI0766	Laboratory ID:	BEI0766-BS1
Preparation:	No Prep Wet Chem	Sequence Name:	LCS
Initial/Final:	5 mL / 5 mL		

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC. #	QC LIMITS REC.
Sulfide	0.499	0.498	99.9	90 - 110

* Values outside of QC limits

Analytical Resources, Incorporated

ANALYSIS BATCH (SEQUENCE) SUMMARY

SM 4500-S2 D-00

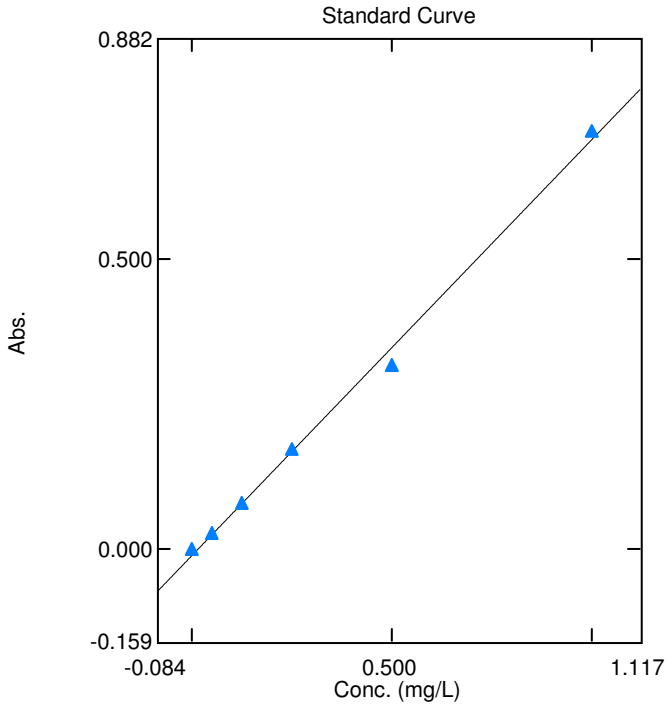
Laboratory:	Analytical Resources, Inc.	SDG:	16I0420
Client:	GeoEngineers	Project:	Gas Works Park Site
Sequence:	SEI0426	Instrument:	UV1800-2
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SEI0426-CAL1	092716NN CURVE-001	Water	09/27/16 16:09
Cal Standard	SEI0426-CAL2	092716NN CURVE-002	Water	09/27/16 16:10
Cal Standard	SEI0426-CAL3	092716NN CURVE-003	Water	09/27/16 16:10
Cal Standard	SEI0426-CAL4	092716NN CURVE-004	Water	09/27/16 16:11
Cal Standard	SEI0426-CAL5	092716NN CURVE-005	Water	09/27/16 16:11
Cal Standard	SEI0426-CAL6	092716NN CURVE-006	Water	09/27/16 16:12
Blank	BEI0766-BLK1		Water	09/27/16 16:21
Initial Cal Blank	SEI0426-ICB1	092716NN-001	Water	09/27/16 16:21
LCS	BEI0766-BS1		Water	09/27/16 16:22
Initial Cal Check	SEI0426-ICV1	092716NN-002	Water	09/27/16 16:22
D-160926	16I0420-01	092716NN-003	Water	09/27/16 16:46
D-160926	BEI0766-MS1	092716NN-005	Water	09/27/16 16:47
D-160926	BEI0766-DUP1	092716NN-004	Water	09/27/16 16:47
PAI-23-S-160926	16I0420-02	092716NN-006	Water	09/27/16 16:49
PAI-23-D-160926	16I0420-03	092716NN-007	Water	09/27/16 16:49
PAI-24-S-160926	16I0420-04	092716NN-008	Water	09/27/16 16:51
PAI-24-D-160926	16I0420-05	092716NN-009	Water	09/27/16 16:51
Calibration Blank	SEI0426-CCB1	092716NN-013	Water	09/27/16 16:54
Calibration Check	SEI0426-CCV1	092716NN-014	Water	09/27/16 16:55
Calibration Blank	SEI0426-CCB2	092716NN-016	Water	09/27/16 17:05
Calibration Check	SEI0426-CCV2	092716NN-017	Water	09/27/16 17:05

Quantitative Measurement Report

Print Date: 09/29/2016 02:31:05 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 092716 NN.pho



Software Information
Software Name: UVProbe
Version: 2.51
Mode: Security Mode

Data Information
Filename: K:\Conventionals\Methods\Sulfide\Instrument Data \Sulfide 092716 NN.pho
Title:
Analyst: Nhan Nguyen
Date/Time: 09/27/2016 05:05:57 PM
Comments:

Instrument Information
Instrument Name: CONV-UV-2
Instrument Type: UV-1800 Series
Model (S/N): CONV-UV-2 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	Abs@650.0	Comments
1	Std 1 (Zero)	09/27/2016	04:09:51 PM	0.000	0.000	
2	Std 2 (0.10 mL)	09/27/2016	04:10:18 PM	0.050	0.027	
3	Std 3 (0.25 mL)	09/27/2016	04:10:40 PM	0.125	0.081	
4	Std 4 (0.50 mL)	09/27/2016	04:11:04 PM	0.250	0.172	
5	Std 5 (1.00 mL)	09/27/2016	04:11:35 PM	0.500	0.317	
6	Std 6 (2.00 mL)	09/27/2016	04:12:02 PM	1.000	0.724	
7						

Quantitative Measurement Report

Print Date: 09/29/2016 02:31:05 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 092716 NN.pho

Sample Table

	Sample ID	Date	Time	Conc	Abs@650.0	DF	Comments
1	SEQ ICB	09/27/2016	04:21:17 PM	0.016	0.000	1.000	
2	SEQ ICV	09/27/2016	04:22:12 PM	0.498	0.348	1.000	
3	16I0420 01 A	09/27/2016	04:46:57 PM	0.072	0.040	1.000	
4	BEI0766 DUP	09/27/2016	04:47:19 PM	0.071	0.039	1.000	
5	BEI0766 MS1	09/27/2016	04:47:55 PM	0.523	0.366	1.000	
6	16I0420 02 A	09/27/2016	04:49:19 PM	0.107	0.065	1.000	
7	16I0420 03 A	09/27/2016	04:49:46 PM	0.068	0.037	1.000	
8	16I0420 04 A	09/27/2016	04:51:08 PM	0.055	0.028	1.000	
9	16I0420 05 A	09/27/2016	04:51:40 PM	0.065	0.035	1.000	
10	16I0423 01 P	09/27/2016	04:52:11 PM	0.048	0.023	1.000	
11	16I0423 02 P	09/27/2016	04:53:10 PM	0.351	0.242	10.000	
12	16I0423 03 P	09/27/2016	04:54:03 PM	0.350	0.241	1.000	
13	SEQ CCB1	09/27/2016	04:54:47 PM	0.025	0.007	1.000	
14	SEQ CCV1	09/27/2016	04:55:12 PM	0.504	0.352	1.000	
15	16I0423 04 P	09/27/2016	05:04:08 PM	0.149	0.096	1.000	
16	SEQ CCB2	09/27/2016	05:05:01 PM	0.015	-0.000	1.000	
17	SEQ CCV2	09/27/2016	05:05:22 PM	0.491	0.343	1.000	
18							

Quantitative Measurement Report

Print Date: 09/29/2016 02:31:05 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 092716 NN.pho

[Wavelengths]
Wavelength Name: Abs@650.0
Wavelength: 650.00 nm

[Calibration Curve]
Column for Cal. Curve: Abs@650.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/L
Selected Wavelength: Abs@650.0
Calibration Equation: Conc = K1*(Abs) + K0
Zero Interception: Not Selected

[Measurement Parameters(Standard)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Measurement Parameters(Sample)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Equations]
Equation Name: AdjConc
Equation: Conc*DF
Units: mg/L

[Pass Fail]

[Method Summary]
Title: Sulfide Colorimetry
Date/Time: 01/06/2016 05:28:50 PM
Comments:
Sample Preparations:

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

SE I Ø426

SULFIDE TITRATION

Buret used for titrations: **S2**

Standardization of sodium thiosulfate titrant

Thiosulfate ID: D004645 *Analyst:* NN

Bi-iodate ID: E004080 *Date & Time:* 9-27-16 14:40

Stock bi-iodate = 0.8123 *grams to* 1000 *mL*

Normality =

Titration of bi-iodate with thiosulfate

mL bi-iodate =	3.00	3.00	3.00	
mL thiosulfate =	3.11	3.12	3.12	*nthio*
Normality thiosulfate =				

*(mL bi-iodate*normbio) / mL thiosulfate*

Normality of Iodine

Iodine ID: E000905 *Analyst:*

Titration of Iodine with thiosulfate *Date & Time:*

mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	3.04	3.05	3.06	*ni*
Normality iodine =				

*(mL thiosulfate*nthio) / mL iodine*

Standardization of Sodium Sulfide Stock

Stock ID = E004725 *Analyst:*

Approx conc in 60 *mL* *Date & Time:*

g Na2S = 0.4653 *mg /mL =*

Titration of standard with thiosulfate

mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	0.73	0.74	0.74	*stkconc (mg/mL)*
Sulfide (mg/mL) =				

*{[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard*

mL required for for 0.025 mg/mL

Analytical Resources, Incorporated

INSTRUMENT BLANKS
SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16I0420
Client: GeoEngineers
Project: Gas Works Park Site
Instrument ID: UV1800-2
Calibration: UNASSIGNED
Sequence: SEI0426
Date Analyzed: 09/27/16 16:21

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SEI0426-ICB1	Sulfide	0.016	0.03	0.050	mg/L	
SEI0426-CCB1	Sulfide	0.025	0.03	0.050	mg/L	
SEI0426-CCB2	Sulfide	0.015	0.03	0.050	mg/L	

Analytical Resources, Incorporated

INITIAL AND CONTINUING CALIBRATION CHECK

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16I0420
Client: GeoEngineers
Project: Gas Works Park Site
Instrument ID: UV1800-2
Calibration: UNASSIGNED
Control Limt: +/- %
Sequence: SEI0426

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SEI0426-ICV1	Sulfide	0.49874	0.498	99.9	mg/L	SM 4500-S2 D-00
SEI0426-CCV1	Sulfide	0.49874	0.504	101	mg/L	SM 4500-S2 D-00
SEI0426-CCV2	Sulfide	0.49874	0.491	98.4	mg/L	SM 4500-S2 D-00

* Values outside of QC limits

Analytical Resources, Incorporated

HOLDING TIME SUMMARY

Analysis: SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc. SDG: 16I0420

Client: GeoEngineers Project: Gas Works Park Site

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
D-160926 16I0420-01	09/26/16 00:00	09/27/16 12:15	09/27/16 16:03	2	7	09/27/16 16:46	2	7	
PAI-23-S-160926 16I0420-02	09/26/16 11:56	09/27/16 12:15	09/27/16 16:03	1	7	09/27/16 16:49	1	7	
PAI-23-D-160926 16I0420-03	09/26/16 11:08	09/27/16 12:15	09/27/16 16:03	1	7	09/27/16 16:49	1	7	
PAI-24-S-160926 16I0420-04	09/26/16 17:00	09/27/16 12:15	09/27/16 16:03	1	7	09/27/16 16:51	1	7	
PAI-24-D-160926 16I0420-05	09/26/16 16:02	09/27/16 12:15	09/27/16 16:03	1	7	09/27/16 16:51	1	7	
Duplicate BEI0766-DUP1	09/26/16 00:00	09/27/16 12:15	09/27/16 16:03	2	7	09/27/16 16:47	2	7	
Matrix Spike BEI0766-MS1	09/26/16 00:00	09/27/16 12:15	09/27/16 16:03	2	7	09/27/16 16:47	2	7	

* Indicates hold time exceedance.

Analytical Resources, Incorporated

METHOD DETECTION AND REPORTING LIMITS

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16I0420
Client: GeoEngineers
Project: Gas Works Park Site
Matrix: Water
Instrument: UV1800-2

Analyte	MDL	RL	Units
Sulfide	0.030	0.050	mg/L

Analytical Resources, Incorporated
Analytical Chemists and Consultants

26 October 2016

Claudia DeLaVia
GeoEngineers
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Gas Works Park Site

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
16J0354	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Cheronne Oreiro, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

GeoEngineers	Project: Gas Works Park Site	
600 Stewart Street, Suite 1700	Project Number: Gas Works Park Site	**Reported:**
Seattle WA, 98101	Project Manager: Claudia DeLaVia	26-Oct-2016 12:33

Case Narrative

Sample receipt

Eight water samples and one NAPL sample were received on October 20, 2016 under ARI workorder 16J0334. For details regarding sample receipt, please refer to the Cooler Receipt Form.

The NAPL sample was subcontracted to Spectra Laboratories in Tacoma, WA. All subcontracted data have been included in this data package.

Sulfide - SM 4500-S2 D-0

The samples were analyzed within the recommended holding times.

The method blank was clean at the reporting limit. The LCS percent recoveries were within control limits.

The matrix spike percent recovery and duplicate RPD were within control limits.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 16J0354	Turn-around Requested: 4-Day TAT	Page: 1 of 1	
ARI Client Company: GeoEngineers	Phone: 253-722-2418	Date: 10/20/16	Ice Present?
Client Contact: Sandra Smith		No. of Coolers:	Cooler Temps:
Client Project Name: Gas Works Park Site			
Client Project #: 0186-846-01	Samplers: Claudia De La Via		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested	Notes/Comments
PAI-21E-D-161017	10/17	1433	W	1		
PAI-21B-S-161017	↓	1530	W	1		archive leftover volume
PAI-31-S-161018	10/18	1320	W	1		
PAI-31-D-161018	↓	1245	W	1		
PAI-32-D-161018	↓	1612	W	1		
PAI-33-S-161019	10/19	1410	W	1		
PAI-33-M-161019	↓	1510	W	1		
PAI-33-D-161019	↓	1255	W	1		
DUP-161019	↓	—	W	1		

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: Claudia De La Via	Printed Name: Brian Warren	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 10/20/16 1445	Date & Time: 10/20/16 1445	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

WORK ORDER

16J0354

Client: GeoEngineers | **Project Manager:** Cheronne Oreiro

Project: Gas Works Park Site | **Project Number:** Gas Works Park Site

Analysis	Due	TAT	Expires	Comments
16J0354-07 PAI-33-M-161019 [Water] Sampled 19-Oct-2016 15:10 (GMT-08:00) Pacific Time (US &				
Sulfide, SM 4500-S2 D-0, Water	26-Oct-2016 15:00	4	26-Oct-2016 15:10	
16J0354-08 PAI-33-D-161019 [Water] Sampled 19-Oct-2016 12:55 (GMT-08:00) Pacific Time (US &				
Sulfide, SM 4500-S2 D-0, Water	26-Oct-2016 15:00	4	26-Oct-2016 12:55	
16J0354-09 DUP-161019 [Water] Sampled 19-Oct-2016 00:00 (GMT-08:00) Pacific Time (US &				
Sulfide, SM 4500-S2 D-0, Water	26-Oct-2016 15:00	4	26-Oct-2016 00:00	

Preservation Confirmation

Container ID	Container Type	pH
16J0354-01 A	Small OJ, 500 mL, NaOH	<9 Fail
16J0354-02 A	Small OJ, 500 mL, NaOH	
16J0354-03 A	Small OJ, 500 mL, NaOH	
16J0354-04 A	Small OJ, 500 mL, NaOH	
16J0354-05 A	Small OJ, 500 mL, NaOH	
16J0354-06 A	Small OJ, 500 mL, NaOH	
16J0354-07 A	Small OJ, 500 mL, NaOH	
16J0354-08 A	Small OJ, 500 mL, NaOH	
16J0354-09 A	Small OJ, 500 mL, NaOH	

TR
Preservation Confirmed By

10-20-16
Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineers

Project Name: Gas Works Park Site

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 1650354

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.4

Time: 1525

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D0053276

Cooler Accepted by: _____ Date: 10/20/16 Time: 1445

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA _____

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

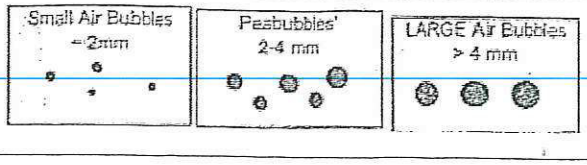
Samples Logged by: FR Date: 10-20-16 Time: 1701

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

GeoEngineers	Project:	Gas Works Park Site	
600 Stewart Street, Suite 1700	Project Number:	Gas Works Park Site	**Reported:**
Seattle, WA 98101	Project Manager:	Claudia DeLaVia	10/26/2016 12:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DUP-161019	16J0354-09	Water	10/19/16 00:00	10/20/16 14:45
PAI-21B-D-161017	16J0354-01	Water	10/17/16 14:33	10/20/16 14:45
PAI-21B-S-161017	16J0354-02	Water	10/17/16 15:30	10/20/16 14:45
PAI-31-D-161018	16J0354-04	Water	10/18/16 12:45	10/20/16 14:45
PAI-31-S-161018	16J0354-03	Water	10/18/16 13:20	10/20/16 14:45
PAI-32-D-161018	16J0354-05	Water	10/18/16 16:12	10/20/16 14:45
PAI-33-D-161019	16J0354-08	Water	10/19/16 12:55	10/20/16 14:45
PAI-33-M-161019	16J0354-07	Water	10/19/16 15:10	10/20/16 14:45
PAI-33-S-161019	16J0354-06	Water	10/19/16 14:10	10/20/16 14:45

Analytical Resources, Incorporated

Internal Chain of Custody

Client:	GeoEngineers	Received:	20-Oct-2016 14:45
Project:	Gas Works Park Site	Received By:	Brian Warren
Number:	Gas Works Park Site	Temp (°C):	1.40

16J0354-01 (PAI-21B-D-161017) Sampled 10/17/2016 14:33

Current Status	*Out*	*Location*	*In*
16J0354-01 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:03 by TER	***START***	10/20/2016 17:03 by TER

16J0354-03 (PAI-31-S-161018) Sampled 10/18/2016 13:20

Current Status	*Out*	*Location*	*In*
16J0354-03 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:04 by TER	***START***	10/20/2016 17:04 by TER

16J0354-04 (PAI-31-D-161018) Sampled 10/18/2016 12:45

Current Status	*Out*	*Location*	*In*
16J0354-04 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:04 by TER	***START***	10/20/2016 17:04 by TER

16J0354-05 (PAI-32-D-161018) Sampled 10/18/2016 16:12

Current Status	*Out*	*Location*	*In*
16J0354-05 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:05 by TER	***START***	10/20/2016 17:05 by TER

16J0354-06 (PAI-33-S-161019) Sampled 10/19/2016 14:10

Current Status	*Out*	*Location*	*In*
16J0354-06 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:05 by TER	***START***	10/20/2016 17:05 by TER

16J0354-07 (PAI-33-M-161019) Sampled 10/19/2016 15:10

Current Status	*Out*	*Location*	*In*
16J0354-07 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:05 by TER	***START***	10/20/2016 17:05 by TER

16J0354-08 (PAI-33-D-161019) Sampled 10/19/2016 12:55

Current Status	*Out*	*Location*	*In*
16J0354-08 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:05 by TER	***START***	10/20/2016 17:05 by TER

16J0354-09 (DUP-161019) Sampled 10/19/2016 00:00

Current Status	*Out*	*Location*	*In*
16J0354-09 A [Small OJ, 500 mL, NaOH]			*Hazard Info:*
Sample Receiving	10/20/2016 17:06 by TER	***START***	10/20/2016 17:06 by TER

QUALIFIERS AND NOTES

Qualifier	Definition
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

SPECTRA Laboratories ...*Where experience matters*

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

10/24/2016

Analytical Resources, Inc.
4611 South 134th Place
Suite 100
Tukwila, WA 98168

Project:	16J0354
Client ID:	16J0354-02
Sample Matrix:	Liquid
Date Sampled:	10/17/2016
Date Received:	10/21/2016
Spectra Project:	2016100738
Spectra Number:	1
	Rush

Analyte	Result	Units	Method
Sulfide	<2.0	mg/Kg	SM 4500-$S2^-$ E

SPECTRA LABORATORIES

Steve Hibbs, Laboratory Manager

a5/bjn

SPECTRA Laboratories ...Where experience matters
2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850 • Fax (253) 572-9838 • www.spectra-lab.com

24-Oct-16

Analytical Resources, Inc.
4611 South 134th Place
Suite 100
Tukwila, WA 98168

Method: SM4500-S2-E
Units: mg/Kg
Spectra Project: 2016100738
Applies to Spectra #'s: 1

QUALITY CONTROL RESULTS

SM846 Chpt7

Method Blank

Date Analyzed: 10/24/16

	Result	
Sulfide	<2.0	mg/Kg

Blank Spike (ICV)

Date Analyzed: 10/24/16

	ICV Conc.	ICV Result	ICV %Rec
Sulfide	320.0	316.0	98.8

SPECTRA LABORATORIES

Steven G. Hibbs
Laboratory Manager

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SUBCONTRACT ORDER
To: Spectra Laboratories
ARI Work Order:16J0354

SENDING LABORATORY:

Analytical Resources, Inc.
4611 S. 134th Place, Suite 100
Tukwilla, WA 98168
Phone: (206) 695-6200
Fax: (206) 695-6201
Project Manager: Cheronne Oreiro

RECEIVING LABORATORY:

Spectra Laboratories
2221 Ross Way
Tacoma, WA 98421
Phone :253-272-4850
Fax: -

2016100738

Analysis	Due	Expires	Sub Laboratory ID	Comments
Sample ID: 16J0354-02	**Water**	**Sampled:17-Oct-2016 15:30**		**Per client request, archive remaining volume (D**
Sulfide, SM 4500-S2 D-0, Wate	26-Oct-2016 15:00	24-Oct-2016 15:30		Per client request, archive remaining volume (DO NOT DISPOSE)

Containers Supplied: 00

NAPL sample

3 day RUSH TAT please.

LV4 pkg (incl. raw data w/ report)

Please return volume to ARI when done.

Thanks!
-CO

Released By	Date	Received By	Date
	10/21/16 1350	Marie Holt	102116 1:50
Released By	Date	Received By	Date

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-21B-D-161017

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-01 File ID: 102116nnRLM-005

Sampled: 10/17/16 14:33 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 10:45

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.499	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-31-S-161018

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-03RE2 File ID: 102116nnRLM-019

Sampled: 10/18/16 13:20 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 11:19

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	3.58	10	0.300	0.500	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-31-D-161018

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-04 File ID: 102116nnRLM-009

Sampled: 10/18/16 12:45 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 10:47

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.050	1	0.030	0.050	U

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-32-D-161018

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-05 File ID: 102116nnRLM-010

Sampled: 10/18/16 16:12 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 10:48

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.050	1	0.030	0.050	U

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-33-S-161019

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-06 File ID: 102116nnRLM-011

Sampled: 10/19/16 14:10 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 10:48

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	1.76	2	0.060	0.100	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-33-M-161019

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-07RE1 File ID: 102116nnRLM-018

Sampled: 10/19/16 15:10 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 11:05

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	20.9	50	1.50	2.50	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-33-D-161019

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-08 File ID: 102116nnRLM-015

Sampled: 10/19/16 12:55 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 10:52

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.475	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

DUP-161019

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16J0354

Matrix: Water Laboratory ID: 16J0354-09 File ID: 102116nnRLM-016

Sampled: 10/19/16 00:00 Prepared: 10/21/16 09:57 Analyzed: 10/21/16 10:53

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0671 Sequence: SEJ0340 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.449	1	0.030	0.050	

PREPARATION BATCH SUMMARY

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc. SDG: 16J0354

Client: GeoEngineers Project: Gas Works Park Site

Batch: BEJ0671 Batch Matrix: Water Preparation: No Prep Wet Chem

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
PAI-21B-D-161017	16J0354-01	102116nnRLM-005	10/21/16 09:57	
PAI-31-S-161018	16J0354-03RE2	102116nnRLM-019	10/21/16 09:57	Added 10/21/2016 by NN
PAI-31-D-161018	16J0354-04	102116nnRLM-009	10/21/16 09:57	
PAI-32-D-161018	16J0354-05	102116nnRLM-010	10/21/16 09:57	
PAI-33-S-161019	16J0354-06	102116nnRLM-011	10/21/16 09:57	
PAI-33-M-161019	16J0354-07RE1	102116nnRLM-018	10/21/16 09:57	Added 10/21/2016 by NN
PAI-33-D-161019	16J0354-08	102116nnRLM-015	10/21/16 09:57	
DUP-161019	16J0354-09	102116nnRLM-016	10/21/16 09:57	
Blank	BEJ0671-BLK1	102116nnRLM-003	10/21/16 09:57	
LCS	BEJ0671-BS1	102116nnRLM-004	10/21/16 09:57	
PAI-21B-D-161017	BEJ0671-DUP1	102116nnRLM-006	10/21/16 09:57	
PAI-21B-D-161017	BEJ0671-MS1	102116nnRLM-007	10/21/16 09:57	

Analytical Resources, Incorporated

Form I

METHOD BLANK DATA SHEET

SM 4500-S2 D-00

TotalAnalytes

Blank

Batch: BEJ0671 Laboratory ID: BEJ0671-BLK1 Prepared: 10/21/16 09:57

Matrix: Water Preparation: No Prep Wet Chem Analyzed: 10/21/16 10:43

Sequence: SEJ0340 Calibration: N/A Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	ND	1	0.030	0.050	U

Analytical Resources, Incorporated

DUPLICATES

SM 4500-S2 D-00

PAI-21B-D-161017

Laboratory: Analytical Resources, Inc.
SDG: 16J0354
Client: GeoEngineers
Project: Gas Works Park Site
Matrix: Water
Laboratory ID: BEJ0671-DUP1
Batch: BEJ0671
Lab Source ID: 16J0354-01
Preparation: No Prep Wet Chem
Initial/Final: 5 mL / 5 mL
Source Sample Name: PAI-21B-D-161017
% Solids:

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/L)	C	DUPLICATE CONCENTRATION (mg/L)	C	RPD %	Q
Sulfide		0.499		0.493		1.21	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

MS / MS DUPLICATE RECOVERY
SM 4500-S2 D-00

Laboratory:	Analytical Resources, Inc.	SDG:	16J0354
Client:	GeoEngineers	Project:	Gas Works Park Site
Matrix:	Water	Analyzed:	10/21/16 10:46
Batch:	BEJ0671	Laboratory ID:	BEJ0671-MS1
Preparation:	No Prep Wet Chem	Sequence Name::	Matrix Spike
Initial/Final:	5 mL / 5 mL	Source Sample:	PAI-21B-D-161017

COMPOUND	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC. #	QC LIMITS REC.
Sulfide	0.499	0.499	0.882	76.8	75 - 125

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

SM 4500-S2 D-00

Laboratory:	Analytical Resources, Inc.	SDG:	16J0354
Client:	GeoEngineers	Project:	Gas Works Park Site
Matrix:	Water	Analyzed:	10/21/16 10:44
Batch:	BEJ0671	Laboratory ID:	BEJ0671-BS1
Preparation:	No Prep Wet Chem	Sequence Name:	LCS
Initial/Final:	5 mL / 5 mL		

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC. #	QC LIMITS REC.
Sulfide	0.499	0.491	98.4	90 - 110

* Values outside of QC limits

Analytical Resources, Incorporated

ANALYSIS BATCH (SEQUENCE) SUMMARY

SM 4500-S2 D-00

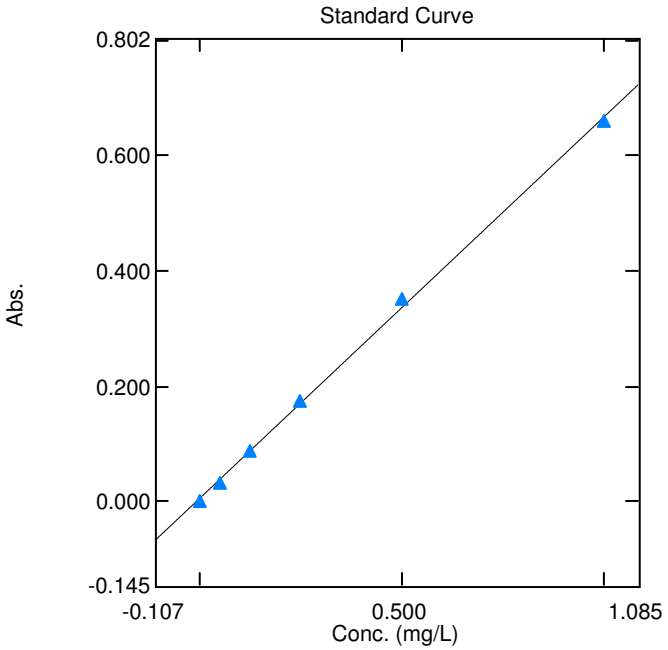
Laboratory:	Analytical Resources, Inc.	SDG:	16J0354
Client:	GeoEngineers	Project:	Gas Works Park Site
Sequence:	SEJ0340	Instrument:	UV1800-2
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SEJ0340-CAL1	102116nnRLMcurve-001	Water	10/21/16 10:22
Cal Standard	SEJ0340-CAL2	102116nnRLMcurve-002	Water	10/21/16 10:23
Cal Standard	SEJ0340-CAL3	102116nnRLMcurve-003	Water	10/21/16 10:24
Cal Standard	SEJ0340-CAL4	102116nnRLMcurve-004	Water	10/21/16 10:24
Cal Standard	SEJ0340-CAL6	102116nnRLMcurve-006	Water	10/21/16 10:25
Cal Standard	SEJ0340-CAL5	102116nnRLMcurve-005	Water	10/21/16 10:25
Initial Cal Blank	SEJ0340-ICB1	102116nnRLM-001	Water	10/21/16 10:27
Initial Cal Check	SEJ0340-ICV1	102116nnRLM-002	Water	10/21/16 10:28
Blank	BEJ0671-BLK1	102116nnRLM-003	Water	10/21/16 10:43
LCS	BEJ0671-BS1	102116nnRLM-004	Water	10/21/16 10:44
PAI-21B-D-161017	16J0354-01	102116nnRLM-005	Water	10/21/16 10:45
PAI-21B-D-161017	BEJ0671-DUP1	102116nnRLM-006	Water	10/21/16 10:45
PAI-21B-D-161017	BEJ0671-MS1	102116nnRLM-007	Water	10/21/16 10:46
PAI-31-D-161018	16J0354-04	102116nnRLM-009	Water	10/21/16 10:47
PAI-32-D-161018	16J0354-05	102116nnRLM-010	Water	10/21/16 10:48
PAI-33-S-161019	16J0354-06	102116nnRLM-011	Water	10/21/16 10:48
Calibration Blank	SEJ0340-CCB1	102116nnRLM-013	Water	10/21/16 10:50
Calibration Check	SEJ0340-CCV1	102116nnRLM-014	Water	10/21/16 10:50
PAI-33-D-161019	16J0354-08	102116nnRLM-015	Water	10/21/16 10:52
DUP-161019	16J0354-09	102116nnRLM-016	Water	10/21/16 10:53
PAI-33-M-161019	16J0354-07RE1	102116nnRLM-018	Water	10/21/16 11:05
PAI-31-S-161018	16J0354-03RE2	102116nnRLM-019	Water	10/21/16 11:19
Calibration Blank	SEJ0340-CCB3	102116nnRLM-020	Water	10/21/16 11:20
Calibration Check	SEJ0340-CCV3	102116nnRLM-021	Water	10/21/16 11:21

Quantitative Measurement Report

Print Date: 10/21/2016 12:20:54 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 102116NN.pho



x = 1.50916 y - 0.00723861
Correlation Coefficient r2 = 0.99875

Software Information
Software Name: UVProbe
Version: 2.51
Mode: Security Mode

Data Information
Filename: K:\Conventionals\Methods\Sulfide\Instrument Data \Sulfide 102116NN.pho
Title:
Analyst: Rebecca Manning
Date/Time: 10/21/2016 11:22:15 AM
Comments:

Instrument Information
Instrument Name: CONV-UV-2
Instrument Type: UV-1800 Series
Model (S/N): CONV-UV-2 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	Abs@650.0	Wgt.Factor	Comments
1	SEQ CAL1	10/21/2016	10:22:41 AM	0.000	-0.000	1.000	
2	SEQ CAL2	10/21/2016	10:23:43 AM	0.050	0.034	1.000	
3	SEQ CAL3	10/21/2016	10:24:11 AM	0.125	0.087	1.000	
4	SEQ CAL4	10/21/2016	10:24:39 AM	0.250	0.173	1.000	
5	SEQ CAL5	10/21/2016	10:25:03 AM	0.500	0.352	1.000	
6	SEQ CAL6	10/21/2016	10:25:31 AM	1.000	0.658	1.000	
7							

Quantitative Measurement Report

Print Date: 10/21/2016 12:20:54 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 102116NN.pho

Sample Table

	Sample ID	Date	Time	Conc	Abs@650.0	AdjConc	DF	Comments
1	SEQ ICB	10/21/2016	10:27:37 AM	-0.010	-0.002	-0.010	1.000	
2	SEQ ICV	10/21/2016	10:28:30 AM	0.492	0.331	0.492	1.000	
3	BEJ0671 BLK1	10/21/2016	10:43:39 AM	0.002	0.006	0.002	1.000	
4	BEJ0671 BS1	10/21/2016	10:44:32 AM	0.491	0.330	0.491	1.000	
5	16J0354 01	10/21/2016	10:45:24 AM	0.499	0.336	0.499	1.000	
6	BEJ0671 DUP1	10/21/2016	10:45:55 AM	0.493	0.331	0.493	1.000	
7	BEJ0671 MS1	10/21/2016	10:46:27 AM	0.882	0.589	0.882	1.000	
8	16J0354 03	10/21/2016	10:47:15 AM	2.475	1.645	4.949	2.000	
9	16J0354 04	10/21/2016	10:47:55 AM	0.022	0.019	0.022	1.000	
10	16J0354 05	10/21/2016	10:48:25 AM	0.024	0.021	0.024	1.000	
11	16J0354 06	10/21/2016	10:48:57 AM	0.879	0.587	1.757	2.000	
12	16J0354 07	10/21/2016	10:49:31 AM	1.034	0.690	20.671	20.000	
13	SEQ CCB1	10/21/2016	10:50:11 AM	-0.008	-0.000	-0.008	1.000	
14	SEQ CCV1	10/21/2016	10:50:44 AM	0.484	0.326	0.484	1.000	
15	16J0354 08	10/21/2016	10:52:45 AM	0.475	0.319	0.475	1.000	
16	16J0354 09	10/21/2016	10:53:27 AM	0.449	0.302	0.449	1.000	
17	16J0354 03 RE1	10/21/2016	11:04:28 AM	1.215	0.810	6.073	5.000	
18	16J0354 07 RE1	10/21/2016	11:05:35 AM	0.417	0.281	20.872	50.000	
19	16J0354 03 RE2	10/21/2016	11:19:26 AM	0.358	0.242	3.577	10.000	
20	SEQ CCB3	10/21/2016	11:20:34 AM	0.005	0.008	0.005	1.000	
21	SEQ CCV3	10/21/2016	11:21:17 AM	0.458	0.308	0.458	1.000	
22								

Quantitative Measurement Report

Print Date: 10/21/2016 12:20:54 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 102116NN.pho

[Wavelengths]
Wavelength Name: Abs@650.0
Wavelength: 650.00 nm

[Calibration Curve]
Column for Cal. Curve: Abs@650.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/L
Selected Wavelength: Abs@650.0
Calibration Equation: Conc = K1*(Abs) + K0
Zero Interception: Not Selected

[Measurement Parameters(Standard)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Measurement Parameters(Sample)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Equations]
Equation Name: AdjConc
Equation: Conc*DF
Units: mg/L

[Pass Fail]

[Method Summary]
Title: Sulfide Colorimetry
Date/Time: 01/06/2016 05:28:50 PM
Comments:
Sample Preparations:

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

SULFIDE TITRATION

Buret used for titrations: **S2**

Standardization of sodium thiosulfate titrant

Thiosulfate ID:	**D004645**			*Analyst:*	*NN*
Bi-iodate ID:	**E004080**			*Date & Time:*	10/21/2016 8:42
Stock bi-iodate =	**0.8123**	*grams to*	1000	*mL*	
Normality =	**0.025**				
Titration of bi-iodate with thiosulfate					
mL bi-iodate =	3.00	3.00	3.00		
mL thiosulfate =	3.28	3.30	3.30	*nthio*	
Normality thiosulfate =	0.023	0.023	0.023	**0.023**	

*(mL bi-iodate*normbio) / mL thiosulfate*

Normality of Iodine

Iodine ID:	**E000905**			*Analyst:*	*NN*
Titration of Iodine with thiosulfate				*Date & Time:*	10/21/2016 8:42
mL iodine =	3.00	3.00	3.00		
mL thiosulfate =	3.29	3.27	3.29	*ni*	
Normality iodine =	0.025	0.025	0.025	**0.025**	

*(mL thiosulfate*nthio) / mL iodine*

Standardization of Sodium Sulfide Stock

Stock ID =	**E005527**			*Analyst:*	*NN*
Approx conc in	*60*	*mL*		*Date & Time:*	10/21/2016 8:42
g Na2S =	0.4658	*mg /mL =*	1.036		
Titration of standard with thiosulfate					
mL Standard =	1.00	1.00	1.00		
mL iodine =	3.00	3.00	3.00		
mL thiosulfate =	0.91	0.91	0.90	*stkconc (mg/mL)*	
Sulfide (mg/mL) =	0.865	0.865	0.868	**0.866**	

*{[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard*

mL required for for 0.025 mg/mL 7.2

SULFIDE TITRATION

Buret used for titrations: **S2**

Standardization of sodium thiosulfate titrant

Thiosulfate ID: D004645 — Analyst: NN

Bi-iodate ID: E004080 — Date & Time: 10-21-16 8:42

Stock bi-iodate = 0.8123 *grams to* 1000 *mL*

Normality =

Titration of bi-iodate with thiosulfate

mL bi-iodate =	3.00	3.00	3.00	
mL thiosulfate =	3.28	3.30	3.30	*nthio*
Normality thiosulfate =				

*(mL bi-iodate*normbio) / mL thiosulfate*

Normality of Iodine

Iodine ID: E000905 — Analyst:

Titration of Iodine with thiosulfate — Date & Time:

mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	3.29	3.27	3.29	*ni*
Normality iodine =				

*(mL thiosulfate*nthio) / mL iodine*

Standardization of Sodium Sulfide Stock

Stock ID = E005527 — Analyst:

Approx conc in 60 *mL* — Date & Time:

g Na2S = *mg /mL =*

Titration of standard with thiosulfate

mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	0.91	0.91	0.90	*stkconc (mg/mL)*
Sulfide (mg/mL) =				

*{[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard*

mL required for for 0.025 mg/mL

Analytical Resources, Incorporated

INSTRUMENT BLANKS
SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16J0354
Client: GeoEngineers
Project: Gas Works Park Site
Instrument ID: UV1800-2
Calibration: UNASSIGNED
Sequence: SEJ0340
Date Analyzed: 10/21/16 10:27

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SEJ0340-ICB1	Sulfide	-0.010	0.03	0.050	mg/L	
SEJ0340-CCB1	Sulfide	-0.008	0.03	0.050	mg/L	
SEJ0340-CCB3	Sulfide	0.005	0.03	0.050	mg/L	

Analytical Resources, Incorporated

INITIAL AND CONTINUING CALIBRATION CHECK

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16J0354
Client: GeoEngineers
Project: Gas Works Park Site
Instrument ID: UV1800-2
Calibration: UNASSIGNED
Control Limt: +/- %
Sequence: SEJ0340

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SEJ0340-ICV1	Sulfide	0.49876	0.492	98.6	mg/L	SM 4500-S2 D-00
SEJ0340-CCV1	Sulfide	0.49876	0.484	97.0	mg/L	SM 4500-S2 D-00
SEJ0340-CCV3	Sulfide	0.49876	0.458	91.8	mg/L	SM 4500-S2 D-00

* Values outside of QC limits

Analytical Resources, Incorporated

HOLDING TIME SUMMARY

Analysis: SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc. SDG: 16J0354

Client: GeoEngineers Project: Gas Works Park Site

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
PAI-21B-D-161017 16J0354-01	10/17/16 14:33	10/20/16 14:45	10/21/16 09:57	4	7	10/21/16 10:45	4	7	
PAI-31-S-161018 16J0354-03RE2	10/18/16 13:20	10/20/16 14:45	10/21/16 09:57	3	7	10/21/16 11:19	3	7	
PAI-31-D-161018 16J0354-04	10/18/16 12:45	10/20/16 14:45	10/21/16 09:57	3	7	10/21/16 10:47	3	7	
PAI-32-D-161018 16J0354-05	10/18/16 16:12	10/20/16 14:45	10/21/16 09:57	3	7	10/21/16 10:48	3	7	
PAI-33-S-161019 16J0354-06	10/19/16 14:10	10/20/16 14:45	10/21/16 09:57	2	7	10/21/16 10:48	2	7	
PAI-33-M-161019 16J0354-07RE1	10/19/16 15:10	10/20/16 14:45	10/21/16 09:57	2	7	10/21/16 11:05	2	7	
PAI-33-D-161019 16J0354-08	10/19/16 12:55	10/20/16 14:45	10/21/16 09:57	2	7	10/21/16 10:52	2	7	
DUP-161019 16J0354-09	10/19/16 00:00	10/20/16 14:45	10/21/16 09:57	2	7	10/21/16 10:53	2	7	
Duplicate BEJ0671-DUP1	10/17/16 14:33	10/20/16 14:45	10/21/16 09:57	4	7	10/21/16 10:45	4	7	
Matrix Spike BEJ0671-MS1	10/17/16 14:33	10/20/16 14:45	10/21/16 09:57	4	7	10/21/16 10:46	4	7	

* Indicates hold time exceedance.

Analytical Resources, Incorporated

METHOD DETECTION AND REPORTING LIMITS

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16J0354
Client: GeoEngineers
Project: Gas Works Park Site
Matrix: Water
Instrument: UV1800-2

Analyte	MDL	RL	Units
Sulfide	0.030	0.050	mg/L

Analytical Resources, Incorporated
Analytical Chemists and Consultants

07 October 2016

Claudia DeLaVia
GeoEngineers
600 Stewart Street, Suite 1700
Seattle, WA 98101

RE: Gas Works Park Site

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
16I0504	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Cheronne Oreiro, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Analytical Report

GeoEngineers	Project: Gas Works Park Site	
600 Stewart Street, Suite 1700	Project Number: 0186-846-01	**Reported:**
Seattle WA, 98101	Project Manager: Claudia DeLaVia	07-Oct-2016 13:14

Case Narrative

Sample receipt

Eleven water samples were received under ARI workorder 16I0504. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Sulfide - SM4500 S2-D97

The samples and associated laboratory QC were analyzed within recommended holding times.

The method blank was clean at the reporting limit. The LCS percent recovery was within control limits.

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: 160504	Turn-around Requested:	Page: 1 of 2	
ARI Client Company: GeoEngineers	Phone:	Date: 9/30/16	Ice Present? Yes
Client Contact: Sandra Smith		No. of Coolers: 1	Cooler Temps: 3.9
Client Project Name: Gas Works Park Site			
Client Project #: 0186-846-01	Samplers: Claudia De La Vina / Brian Anderson		

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Sulfide	Notes/Comments
PAH-15S-160927	9/27	1100	W	1	X	
PAH-15-D-160927	9/27	1154		1	X	
PAH-25-D-160927	9/27	0907		1	X	
PAH-27-S-160928	9/28	1614		1	X	
PAH-27-D-160928	9/28	1647		1	X	
PAH-28-S-160929	9/29	1021		1	X	
PAH-26-S-160928	9/28	1046		1	X	
PAH-26-D-160928	9/28	1131		1	X	
D-160928	9/28	—		1	X	
PAH-30-S-160929	9/29	1640		1	X	

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: Claudia De La Vina	Printed Name: Brian Warm	Printed Name:	Printed Name:
	Company: Geo	Company: ARI	Company:	Company:
	Date & Time: 9/30/16 1301	Date & Time: 9/30/16 1301	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: 160504	Turn-around Requested:	Page: 2 of 2	
ARI Client Company: GeoEngineers	Phone:	Date: 9/30/16	Ice Present? Yes
Client Contact: Sandra Smith		No. of Coolers: 1	Cooler Temps:
Client Project Name: Gas works Park Site			
Client Project #: 0186-846-01	Samplers: Claudia + Brian		

Page 1 of 4

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: SVHFDE								Notes/Comments
~~AAI~~													
~~AAI-ISS-160927~~	~~9/27~~	~~1154~~											
RINSE-160929	9/29	1430	W	1	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Claudia DeLaVar	Printed Name: Brian Werren	Printed Name:	Printed Name:
	Company: GeoEngineers	Company: ARI	Company:	Company:
	Date & Time: 9/30/16 1301	Date & Time: 9/30/16 1301	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: GeoEngineers — Project Name: Gas Works Park Site

COC No(s): _____ NA — Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 161050 4 — Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.9

Time: 1530

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: D00527C

Cooler Accepted by: _____ Date: 9/30/16 Time: 1301

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA _____

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

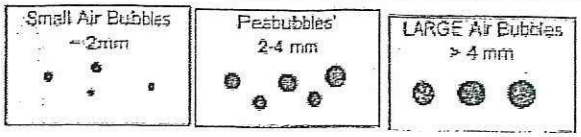
Samples Logged by: SM Date: 9-30-16 Time: 1637

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

WORK ORDER

16I0504

Client: GeoEngineers | **Project Manager:** Cheronne Oreiro

Project: Gas Works Park Site | **Project Number:** 0186-846-01

Preservation Confirmation

Container ID	Container Type	pH	
16I0504-01 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-02 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-03 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-04 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-05 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-06 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-07 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-08 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-09 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-10 A	Small OJ, 500 mL, ZnOAC	<9	fail
16I0504-11 A	Small OJ, 500 mL, ZnOAC	<9	fail

Preservation Confirmed By

9-30-16
Date

JM
Reviewed By

9-30-16
Date

GeoEngineers	Project: Gas Works Park Site	
600 Stewart Street, Suite 1700	Project Number: 0186-846-01	**Reported:**
Seattle, WA 98101	Project Manager: Claudia DeLaVia	10/07/2016 13:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
D-160928	16I0504-09	Water	09/28/16 00:00	09/30/16 16:36
PAI-15-D-160927	16I0504-02	Water	09/27/16 11:54	09/30/16 16:36
PAI-15-S-160927	16I0504-01	Water	09/27/16 11:00	09/30/16 16:36
PAI-25-D-160927	16I0504-03	Water	09/27/16 09:07	09/30/16 16:36
PAI-26-D-160928	16I0504-08	Water	09/28/16 11:31	09/30/16 16:36
PAI-26-S-160928	16I0504-07	Water	09/28/16 10:46	09/30/16 16:36
PAI-27-D-160928	16I0504-05	Water	09/28/16 16:47	09/30/16 16:36
PAI-27-S-160928	16I0504-04	Water	09/28/16 16:14	09/30/16 16:36
PAI-28-S-160929	16I0504-06	Water	09/29/16 10:21	09/30/16 16:36
PAI-30-S-160929	16I0504-10	Water	09/28/16 16:40	09/30/16 16:36
RINSE-160929	16I0504-11	Water	09/28/16 14:30	09/30/16 16:36

Analytical Resources, Incorporated

Internal Chain of Custody

Client:	GeoEngineers	Received:	30-Sep-2016 16:36
Project:	Gas Works Park Site	Received By:	Justin Meyer
Number:	0186-846-01	Temp (°C):	3.90

16I0504-01 (PAI-15-S-160927) Sampled 09/27/2016 11:00

Current Status	*Out*	*Location*	*In*
16I0504-01 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:41 by JEM	***START***	09/30/2016 16:41 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-02 (PAI-15-D-160927) Sampled 09/27/2016 11:54

Current Status	*Out*	*Location*	*In*
16I0504-02 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:41 by JEM	***START***	09/30/2016 16:41 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-03 (PAI-25-D-160927) Sampled 09/27/2016 09:07

Current Status	*Out*	*Location*	*In*
16I0504-03 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:42 by JEM	***START***	09/30/2016 16:42 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-04 (PAI-27-S-160928) Sampled 09/28/2016 16:14

Current Status	*Out*	*Location*	*In*
16I0504-04 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:42 by JEM	***START***	09/30/2016 16:42 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-05 (PAI-27-D-160928) Sampled 09/28/2016 16:47

Current Status	*Out*	*Location*	*In*
16I0504-05 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:43 by JEM	***START***	09/30/2016 16:43 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-06 (PAI-28-S-160929) Sampled 09/29/2016 10:21

Current Status	*Out*	*Location*	*In*
16I0504-06 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:43 by JEM	***START***	09/30/2016 16:43 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-07 (PAI-26-S-160928) Sampled 09/28/2016 10:46

Current Status	*Out*	*Location*	*In*
16I0504-07 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:43 by JEM	***START***	09/30/2016 16:43 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-08 (PAI-26-D-160928) Sampled 09/28/2016 11:31

Current Status	*Out*	*Location*	*In*
16I0504-08 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:44 by JEM	***START***	09/30/2016 16:44 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

Analytical Resources, Incorporated

Internal Chain of Custody

Client:	GeoEngineers	Received:	30-Sep-2016 16:36
Project:	Gas Works Park Site	Received By:	Justin Meyer
Number:	0186-846-01	Temp (°C):	3.90

16I0504-09 (D-160928) Sampled 09/28/2016 00:00

Current Status	*Out*	*Location*	*In*
16I0504-09 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:45 by JEM	***START***	09/30/2016 16:45 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-10 (PAI-30-S-160929) Sampled 09/28/2016 16:40

Current Status	*Out*	*Location*	*In*
16I0504-10 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:45 by JEM	***START***	09/30/2016 16:45 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

16I0504-11 (RINSE-160929) Sampled 09/28/2016 14:30

Current Status	*Out*	*Location*	*In*
16I0504-11 A [Small OJ, 500 mL, ZnOAC]			*Hazard Info:*
Sample Receiving	09/30/2016 16:47 by JEM	***START***	09/30/2016 16:47 by JEM
Conventionals	09/30/2016 17:19 by UW	r-33 k	10/04/2016 12:23 by UW

QUALIFIERS AND NOTES

Qualifier	Definition
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

WORK ORDER

16I0504

Client: GeoEngineers | **Project Manager:** Cheronne Oreiro

Project: Gas Works Park Site | **Project Number:** 0186-846-01

Preservation Confirmation

Container ID	Container Type	pH		
16I0504-01 A	Small OJ, 500 mL, ZnOAC	<9	fail	>9
16I0504-02 A	Small OJ, 500 mL, ZnOAC	<9	fail	2ml NaOH 6N
16I0504-03 A	Small OJ, 500 mL, ZnOAC	<9	fail	9-30-16
16I0504-04 A	Small OJ, 500 mL, ZnOAC	<9	fail	w
16I0504-05 A	Small OJ, 500 mL, ZnOAC	<9	fail	
16I0504-06 A	Small OJ, 500 mL, ZnOAC	<9	fail	
16I0504-07 A	Small OJ, 500 mL, ZnOAC	<9	fail	
16I0504-08 A	Small OJ, 500 mL, ZnOAC	<9	fail	
16I0504-09 A	Small OJ, 500 mL, ZnOAC	<9	fail	
16I0504-10 A	Small OJ, 500 mL, ZnOAC	<9	fail	
16I0504-11 A	Small OJ, 500 mL, ZnOAC	<9	fail	

Preservation Confirmed By

9-30-16
Date

JM
Reviewed By

9-30-16
Date

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-15-S-160927

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-01 File ID: 100416NN-010

Sampled: 09/27/16 11:00 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:01

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	8.65	10	0.300	0.500	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-15-D-160927

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-02 File ID: 100416NN-011

Sampled: 09/27/16 11:54 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:01

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	9.36	10	0.300	0.500	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-25-D-160927

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-03 File ID: 100416NN-012

Sampled: 09/27/16 09:07 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:02

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	35.2	50	1.50	2.50	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-27-S-160928

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-04 File ID: 100416NN-015

Sampled: 09/28/16 16:14 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:35

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	1.00	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-27-D-160928

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-05 File ID: 100416NN-016

Sampled: 09/28/16 16:47 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:36

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.154	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-28-S-160929

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-06 File ID: 100416NN-017

Sampled: 09/29/16 10:21 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:36

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.210	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-26-S-160928

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-07 File ID: 100416NN-018

Sampled: 09/28/16 10:46 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:37

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.095	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-26-D-160928

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-08 File ID: 100416NN-019

Sampled: 09/28/16 11:31 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:37

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.086	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

D-160928

SM 4500-S2 D-00

TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-09 File ID: 100416NN-020

Sampled: 09/28/16 00:00 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:38

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.096	1	0.030	0.050	

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

PAI-30-S-160929

SM 4500-S2 D-00
TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Ground Water Laboratory ID: 16I0504-10 File ID: 100416NN-021

Sampled: 09/28/16 16:40 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:38

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.050	1	0.030	0.050	U

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

RINSE-160929

SM 4500-S2 D-00
TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Water Laboratory ID: 16I0504-11 File ID: 100416NN-022

Sampled: 09/28/16 14:30 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:38

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.050	1	0.030	0.050	U

Analytical Resources, Incorporated

ANALYSIS BATCH (SEQUENCE) SUMMARY

SM 4500-S2 D-00

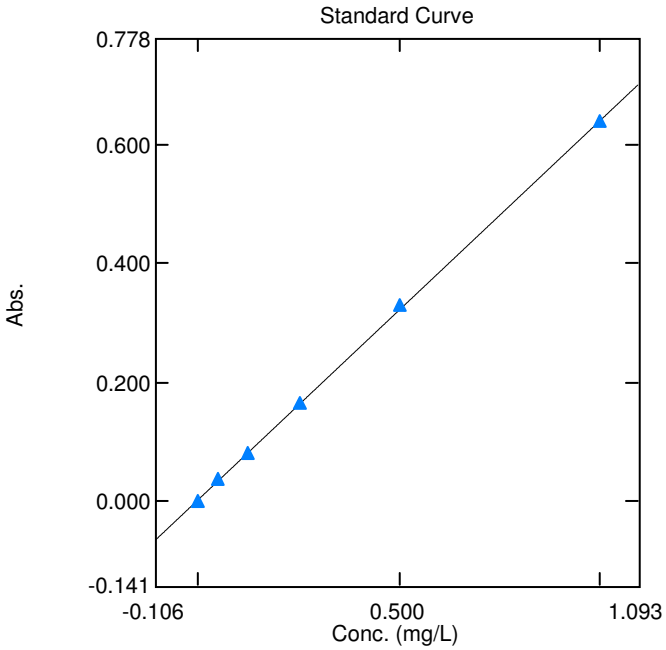
Laboratory:	Analytical Resources, Inc.	SDG:	16I0504
Client:	GeoEngineers	Project:	Gas Works Park Site
Sequence:	SEJ0066	Instrument:	UV1800-2
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SEJ0066-CAL1	100416NNCURVE-001	Water	10/04/16 10:32
Cal Standard	SEJ0066-CAL2	100416NNCURVE-002	Water	10/04/16 10:33
Cal Standard	SEJ0066-CAL3	100416NNCURVE-003	Water	10/04/16 10:33
Cal Standard	SEJ0066-CAL4	100416NNCURVE-004	Water	10/04/16 10:33
Cal Standard	SEJ0066-CAL5	100416NNCURVE-005	Water	10/04/16 10:34
Cal Standard	SEJ0066-CAL6	100416NNCURVE-006	Water	10/04/16 10:34
Initial Cal Check	SEJ0066-ICV1	100416NN-002	Water	10/04/16 10:36
Initial Cal Blank	SEJ0066-ICB1	100416NN-001	Water	10/04/16 10:36
Blank	BEJ0018-BLK1	100416NN-003	Water	10/04/16 10:55
LCS	BEJ0018-BS1	100416NN-004	Water	10/04/16 10:56
PAI-15-D-160927	16I0504-02	100416NN-011	Water	10/04/16 11:01
PAI-15-S-160927	16I0504-01	100416NN-010	Water	10/04/16 11:01
PAI-25-D-160927	16I0504-03	100416NN-012	Water	10/04/16 11:02
Calibration Blank	SEJ0066-CCB1	100416NN-013	Water	10/04/16 11:02
Calibration Check	SEJ0066-CCV1	100416NN-014	Water	10/04/16 11:05
PAI-27-S-160928	16I0504-04	100416NN-015	Water	10/04/16 11:35
PAI-28-S-160929	16I0504-06	100416NN-017	Water	10/04/16 11:36
PAI-27-D-160928	16I0504-05	100416NN-016	Water	10/04/16 11:36
PAI-26-S-160928	16I0504-07	100416NN-018	Water	10/04/16 11:37
PAI-26-D-160928	16I0504-08	100416NN-019	Water	10/04/16 11:37
PAI-30-S-160929	16I0504-10	100416NN-021	Water	10/04/16 11:38
RINSE-160929	16I0504-11	100416NN-022	Water	10/04/16 11:38
D-160928	16I0504-09	100416NN-020	Water	10/04/16 11:38
Calibration Check	SEJ0066-CCV2	100416NN-026	Water	10/04/16 11:40
Calibration Blank	SEJ0066-CCB2	100416NN-025	Water	10/04/16 11:40
Calibration Blank	SEJ0066-CCB3	100416NN-033	Water	10/04/16 12:24
Calibration Check	SEJ0066-CCV3	100416NN-034	Water	10/04/16 12:25

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho



x = 1.56566 y - 0.00561971
Correlation Coefficient r2 = 0.99967

Software Information
Software Name: UVProbe
Version: 2.51
Mode: Security Mode

Data Information
Filename: K:\Conventionals\Methods\Sulfide\Instrument Data \Sulfide 100416 NN.pho
Title:
Analyst: Nhan Nguyen
Date/Time: 10/04/2016 12:25:45 PM
Comments:

Instrument Information
Instrument Name: CONV-UV-2
Instrument Type: UV-1800 Series
Model (S/N): CONV-UV-2 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	Abs@650.0	Wgt.Factor	Comments
1	Std 1 (Zero)	10/04/2016	10:32:36 AM	0.000	-0.000	1.000	
2	Std 2 (0.10 mL)	10/04/2016	10:33:02 AM	0.050	0.036	1.000	
3	Std 3 (0.25 mL)	10/04/2016	10:33:24 AM	0.125	0.080	1.000	
4	Std 4 (0.50 mL)	10/04/2016	10:33:47 AM	0.250	0.167	1.000	
5	Std 5 (1.00 mL)	10/04/2016	10:34:12 AM	0.500	0.329	1.000	
6	Std 6 (2.00 mL)	10/04/2016	10:34:38 AM	1.000	0.638	1.000	
7							

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

Sample Table

	Sample ID	Date	Time	Conc	Abs@650.0	AdjConc	DF	
1	SEQ ICB	10/04/2016	10:36:28 AM	-0.006	-0.000	-0.006	1.000	
2	SEQ ICV	10/04/2016	10:36:54 AM	0.514	0.332	0.514	1.000	
3	BEJ0018 BLK1	10/04/2016	10:55:48 AM	0.019	0.016	0.019	1.000	
4	BEJ0018 BS1	10/04/2016	10:56:16 AM	0.508	0.328	0.508	1.000	
5	16I0479 01	10/04/2016	10:56:49 AM	0.096	0.065	0.096	1.000	
6	16I0479 02	10/04/2016	10:57:14 AM	0.413	0.267	4.126	10.000	
7	16I0479 03	10/04/2016	10:57:54 AM	-0.013	-0.004	-0.013	1.000	
8	16I0479 04	10/04/2016	10:58:19 AM	-0.000	0.003	-0.000	1.000	
9	16I0479 05	10/04/2016	10:58:41 AM	0.011	0.011	0.011	1.000	
10	16I0504 01	10/04/2016	11:01:14 AM	0.865	0.556	8.654	10.000	
11	16I0504 02	10/04/2016	11:01:52 AM	0.936	0.601	9.356	10.000	
12	16I0504 03	10/04/2016	11:02:21 AM	0.704	0.453	35.191	50.000	
13	SEQ CCB1	10/04/2016	11:02:56 AM	0.011	0.011	0.011	1.000	
14	SEQ CCV1	10/04/2016	11:05:59 AM	0.457	0.295	0.457	1.000	
15	16I0504 04	10/04/2016	11:35:29 AM	1.003	0.644	1.003	1.000	DILUTE 2X
16	16I0504 05	10/04/2016	11:36:12 AM	0.154	0.102	0.154	1.000	
17	16I0504 06	10/04/2016	11:36:42 AM	0.210	0.138	0.210	1.000	
18	16I0504 07	10/04/2016	11:37:06 AM	0.095	0.065	0.095	1.000	
19	16I0504 08	10/04/2016	11:37:35 AM	0.086	0.058	0.086	1.000	
20	16I0504 09	10/04/2016	11:38:01 AM	0.096	0.065	0.096	1.000	
21	16I0504 10	10/04/2016	11:38:28 AM	-0.010	-0.003	-0.010	1.000	
22	16I0504 11	10/04/2016	11:38:54 AM	-0.020	-0.009	-0.020	1.000	
23	16J0004 01	10/04/2016	11:39:18 AM	0.070	0.048	0.070	1.000	
24	16J0004 02	10/04/2016	11:39:46 AM	0.298	0.194	0.298	1.000	
25	SEQ CCB2	10/04/2016	11:40:14 AM	-0.005	0.000	-0.005	1.000	
26	SEQ CCV2	10/04/2016	11:40:40 AM	0.453	0.293	0.453	1.000	
27	16J0004 03	10/04/2016	12:06:56 PM	0.387	0.251	19.363	50.000	
28	BEJ0018 DUP1	10/04/2016	12:07:23 PM	0.371	0.241	18.557	50.000	
29	BEJ0018 MS1	10/04/2016	12:07:50 PM	0.478	0.309	23.877	50.000	.05mL STK --> 5 M
30	16J0004 04	10/04/2016	12:09:23 PM	-0.009	-0.002	-0.009	1.000	
31	16I0504 04 RE1	10/04/2016	12:09:48 PM	0.468	0.303	0.937	2.000	
32	BEJ0018 MS2	10/04/2016	12:23:54 PM	0.690	0.444	34.511	50.000	.1ML STK --> 5 ML
33	SEQ CCB3	10/04/2016	12:24:20 PM	0.010	0.010	0.010	1.000	
34	SEQ CCV3	10/04/2016	12:25:20 PM	0.516	0.333	0.516	1.000	
35								

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

[Wavelengths]
Wavelength Name: Abs@650.0
Wavelength: 650.00 nm

[Calibration Curve]
Column for Cal. Curve: Abs@650.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/L
Selected Wavelength: Abs@650.0
Calibration Equation: Conc = K1*(Abs) + K0
Zero Interception: Not Selected

[Measurement Parameters(Standard)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Measurement Parameters(Sample)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Equations]
Equation Name: AdjConc
Equation: Conc*DF
Units: mg/L

[Pass Fail]

[Method Summary]
Title: Sulfide Colorimetry
Date/Time: 01/06/2016 05:28:50 PM
Comments:
Sample Preparations:

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

SEJ0066

SULFIDE TITRATION

Buret used for titrations: **S2**

Standardization of sodium thiosulfate titrant

Thiosulfate ID: D004645 — Analyst: N/A

Bi-iodate ID: E004080 — Date & Time: 10-4-16 9:02

Stock bi-iodate = .8123 *grams to* 1000 *mL*

Normality =

Titration of bi-iodate with thiosulfate

mL bi-iodate =	3.00	3.00	3.00	
mL thiosulfate =	3.14	3.15	3.15	*nthio*
Normality thiosulfate =				

*(mL bi-iodate*normbio) / mL thiosulfate*

Normality of Iodine

Iodine ID: E000905 — Analyst:

Titration of Iodine with thiosulfate — Date & Time:

mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	3.08	3.05	3.05	*ni*
Normality iodine =				

*(mL thiosulfate*nthio) / mL iodine*

Standardization of Sodium Sulfide Stock

Stock ID = E005082 — Analyst:

Approx conc in 60 *mL* — Date & Time:

g Na2S = 0.4580 *mg /mL =*

Titration of standard with thiosulfate

mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	0.94
mL thiosulfate =	~~0.90~~	0.93	0.93	*stkconc (mg/mL)*
Sulfide (mg/mL) =	10-4-16			

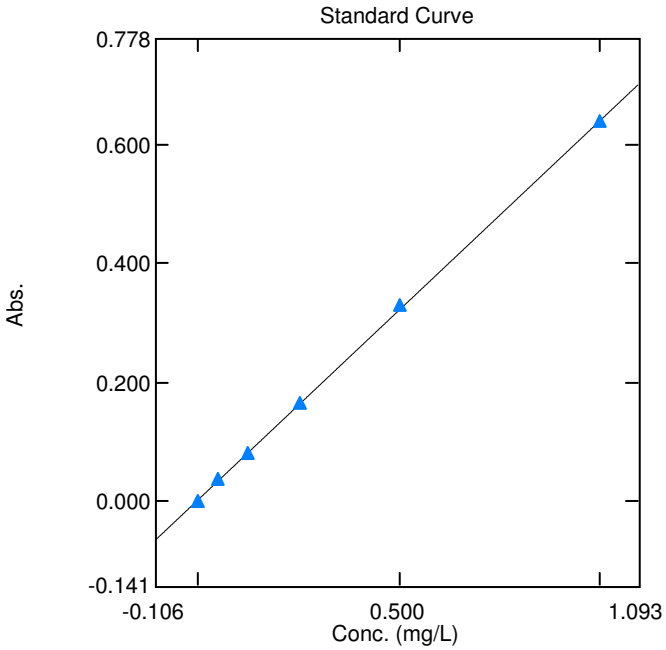
*{[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard*

mL required for for 0.025 mg/mL

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho



x = 1.56566 y - 0.00561971
Correlation Coefficient r2 = 0.99967

Software Information
Software Name: UVProbe
Version: 2.51
Mode: Security Mode

Data Information
Filename: K:\Conventionals\Methods\Sulfide\Instrument Data \Sulfide 100416 NN.pho
Title:
Analyst: Nhan Nguyen
Date/Time: 10/04/2016 12:25:45 PM
Comments:

Instrument Information
Instrument Name: CONV-UV-2
Instrument Type: UV-1800 Series
Model (S/N): CONV-UV-2 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	Abs@650.0	Wgt.Factor	Comments
1	Std 1 (Zero)	10/04/2016	10:32:36 AM	0.000	-0.000	1.000	
2	Std 2 (0.10 mL)	10/04/2016	10:33:02 AM	0.050	0.036	1.000	
3	Std 3 (0.25 mL)	10/04/2016	10:33:24 AM	0.125	0.080	1.000	
4	Std 4 (0.50 mL)	10/04/2016	10:33:47 AM	0.250	0.167	1.000	
5	Std 5 (1.00 mL)	10/04/2016	10:34:12 AM	0.500	0.329	1.000	
6	Std 6 (2.00 mL)	10/04/2016	10:34:38 AM	1.000	0.638	1.000	
7							

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

Sample Table

	Sample ID	Date	Time	Conc	Abs@650.0	AdjConc	DF	
1	SEQ ICB	10/04/2016	10:36:28 AM	-0.006	-0.000	-0.006	1.000	
2	SEQ ICV	10/04/2016	10:36:54 AM	0.514	0.332	0.514	1.000	
3	BEJ0018 BLK1	10/04/2016	10:55:48 AM	0.019	0.016	0.019	1.000	
4	BEJ0018 BS1	10/04/2016	10:56:16 AM	0.508	0.328	0.508	1.000	
5	16I0479 01	10/04/2016	10:56:49 AM	0.096	0.065	0.096	1.000	
6	16I0479 02	10/04/2016	10:57:14 AM	0.413	0.267	4.126	10.000	
7	16I0479 03	10/04/2016	10:57:54 AM	-0.013	-0.004	-0.013	1.000	
8	16I0479 04	10/04/2016	10:58:19 AM	-0.000	0.003	-0.000	1.000	
9	16I0479 05	10/04/2016	10:58:41 AM	0.011	0.011	0.011	1.000	
10	16I0504 01	10/04/2016	11:01:14 AM	0.865	0.556	8.654	10.000	
11	16I0504 02	10/04/2016	11:01:52 AM	0.936	0.601	9.356	10.000	
12	16I0504 03	10/04/2016	11:02:21 AM	0.704	0.453	35.191	50.000	
13	SEQ CCB1	10/04/2016	11:02:56 AM	0.011	0.011	0.011	1.000	
14	SEQ CCV1	10/04/2016	11:05:59 AM	0.457	0.295	0.457	1.000	
15	16I0504 04	10/04/2016	11:35:29 AM	1.003	0.644	1.003	1.000	DILUTE 2X
16	16I0504 05	10/04/2016	11:36:12 AM	0.154	0.102	0.154	1.000	
17	16I0504 06	10/04/2016	11:36:42 AM	0.210	0.138	0.210	1.000	
18	16I0504 07	10/04/2016	11:37:06 AM	0.095	0.065	0.095	1.000	
19	16I0504 08	10/04/2016	11:37:35 AM	0.086	0.058	0.086	1.000	
20	16I0504 09	10/04/2016	11:38:01 AM	0.096	0.065	0.096	1.000	
21	16I0504 10	10/04/2016	11:38:28 AM	-0.010	-0.003	-0.010	1.000	
22	16I0504 11	10/04/2016	11:38:54 AM	-0.020	-0.009	-0.020	1.000	
23	16J0004 01	10/04/2016	11:39:18 AM	0.070	0.048	0.070	1.000	
24	16J0004 02	10/04/2016	11:39:46 AM	0.298	0.194	0.298	1.000	
25	SEQ CCB2	10/04/2016	11:40:14 AM	-0.005	0.000	-0.005	1.000	
26	SEQ CCV2	10/04/2016	11:40:40 AM	0.453	0.293	0.453	1.000	
27	16J0004 03	10/04/2016	12:06:56 PM	0.387	0.251	19.363	50.000	
28	BEJ0018 DUP1	10/04/2016	12:07:23 PM	0.371	0.241	18.557	50.000	
29	BEJ0018 MS1	10/04/2016	12:07:50 PM	0.478	0.309	23.877	50.000	.05mL STK --> 5 M
30	16J0004 04	10/04/2016	12:09:23 PM	-0.009	-0.002	-0.009	1.000	
31	16I0504 04 RE1	10/04/2016	12:09:48 PM	0.468	0.303	0.937	2.000	
32	BEJ0018 MS2	10/04/2016	12:23:54 PM	0.690	0.444	34.511	50.000	.1ML STK --> 5 ML
33	SEQ CCB3	10/04/2016	12:24:20 PM	0.010	0.010	0.010	1.000	
34	SEQ CCV3	10/04/2016	12:25:20 PM	0.516	0.333	0.516	1.000	
35								

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

[Wavelengths]
Wavelength Name: Abs@650.0
Wavelength: 650.00 nm

[Calibration Curve]
Column for Cal. Curve: Abs@650.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/L
Selected Wavelength: Abs@650.0
Calibration Equation: Conc = K1*(Abs) + K0
Zero Interception: Not Selected

[Measurement Parameters(Standard)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Measurement Parameters(Sample)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Equations]
Equation Name: AdjConc
Equation: Conc*DF
Units: mg/L

[Pass Fail]

[Method Summary]
Title: Sulfide Colorimetry
Date/Time: 01/06/2016 05:28:50 PM
Comments:
Sample Preparations:

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

Analytical Resources, Incorporated

Form I
INORGANIC ANALYSIS DATA SHEET

RINSE-160929

SM 4500-S2 D-00
TotalAnalytes

Laboratory: Analytical Resources, Inc. Project: Gas Works Park Site

Client: GeoEngineers SDG: 16I0504

Matrix: Water Laboratory ID: 16I0504-11 File ID: 100416NN-022

Sampled: 09/28/16 14:30 Prepared: 10/03/16 08:20 Analyzed: 10/04/16 11:38

Solids (wt%): 0.00 Preparation: No Prep Wet Chem Initial/Final: 5 mL / 5 mL

Batch: BEJ0018 Sequence: SEJ0066 Calibration: UNASSIGNED Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	0.050	1	0.030	0.050	U

PREPARATION BATCH SUMMARY

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc. SDG: 16I0504

Client: GeoEngineers Project: Gas Works Park Site

Batch: BEJ0018 Batch Matrix: Water Preparation: No Prep Wet Chem

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
PAI-15-S-160927	16I0504-01	100416NN-010	10/03/16 08:20	
PAI-15-D-160927	16I0504-02	100416NN-011	10/03/16 08:20	
PAI-25-D-160927	16I0504-03	100416NN-012	10/03/16 08:20	
PAI-27-S-160928	16I0504-04	100416NN-015	10/03/16 08:20	
PAI-27-D-160928	16I0504-05	100416NN-016	10/03/16 08:20	
PAI-28-S-160929	16I0504-06	100416NN-017	10/03/16 08:20	
PAI-26-S-160928	16I0504-07	100416NN-018	10/03/16 08:20	
PAI-26-D-160928	16I0504-08	100416NN-019	10/03/16 08:20	
D-160928	16I0504-09	100416NN-020	10/03/16 08:20	
PAI-30-S-160929	16I0504-10	100416NN-021	10/03/16 08:20	
RINSE-160929	16I0504-11	100416NN-022	10/03/16 08:20	
Blank	BEJ0018-BLK1	100416NN-003	10/03/16 08:20	
LCS	BEJ0018-BS1	100416NN-004	10/03/16 08:20	

Analytical Resources, Incorporated

Form I

METHOD BLANK DATA SHEET

SM 4500-S2 D-00

TotalAnalytes

Blank

Batch: BEJ0018 | Laboratory ID: BEJ0018-BLK1 | Prepared: 10/03/16 08:20

Matrix: Water | Preparation: No Prep Wet Chem | Analyzed: 10/04/16 10:55

Sequence: SEJ0066 | Calibration: N/A | Instrument: UV1800-2

CAS NO.	Analyte	Concentration (mg/L)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	ND	1	0.030	0.050	U

LCS / LCS DUPLICATE RECOVERY

SM 4500-S2 D-00

Laboratory:	Analytical Resources, Inc.	SDG:	16I0504
Client:	GeoEngineers	Project:	Gas Works Park Site
Matrix:	Water	Analyzed:	10/04/16 10:56
Batch:	BEJ0018	Laboratory ID:	BEJ0018-BS1
Preparation:	No Prep Wet Chem	Sequence Name:	LCS
Initial/Final:	5 mL / 5 mL		

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC. #	QC LIMITS REC.
Sulfide	0.499	0.508	102	90 - 110

* Values outside of QC limits

Analytical Resources, Incorporated

ANALYSIS BATCH (SEQUENCE) SUMMARY

SM 4500-S2 D-00

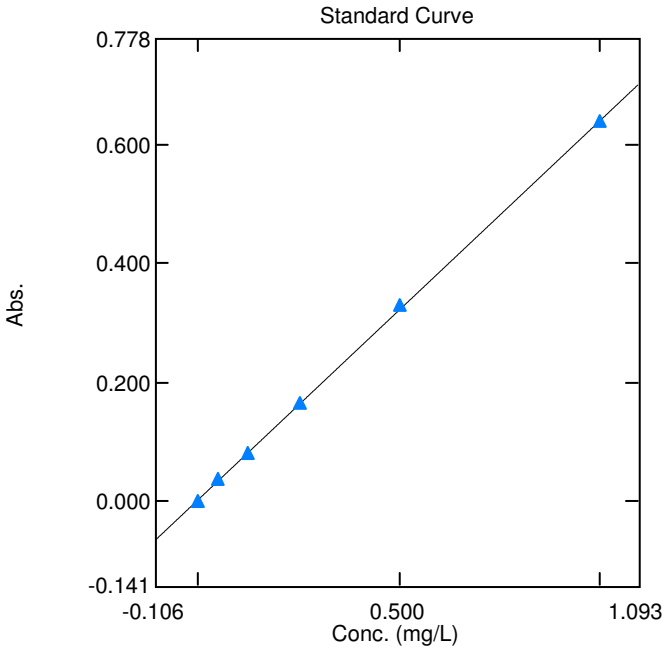
Laboratory:	Analytical Resources, Inc.	SDG:	16I0504
Client:	GeoEngineers	Project:	Gas Works Park Site
Sequence:	SEJ0066	Instrument:	UV1800-2
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SEJ0066-CAL1	100416NNCURVE-001	Water	10/04/16 10:32
Cal Standard	SEJ0066-CAL2	100416NNCURVE-002	Water	10/04/16 10:33
Cal Standard	SEJ0066-CAL3	100416NNCURVE-003	Water	10/04/16 10:33
Cal Standard	SEJ0066-CAL4	100416NNCURVE-004	Water	10/04/16 10:33
Cal Standard	SEJ0066-CAL5	100416NNCURVE-005	Water	10/04/16 10:34
Cal Standard	SEJ0066-CAL6	100416NNCURVE-006	Water	10/04/16 10:34
Initial Cal Check	SEJ0066-ICV1	100416NN-002	Water	10/04/16 10:36
Initial Cal Blank	SEJ0066-ICB1	100416NN-001	Water	10/04/16 10:36
Blank	BEJ0018-BLK1	100416NN-003	Water	10/04/16 10:55
LCS	BEJ0018-BS1	100416NN-004	Water	10/04/16 10:56
PAI-15-D-160927	16I0504-02	100416NN-011	Water	10/04/16 11:01
PAI-15-S-160927	16I0504-01	100416NN-010	Water	10/04/16 11:01
PAI-25-D-160927	16I0504-03	100416NN-012	Water	10/04/16 11:02
Calibration Blank	SEJ0066-CCB1	100416NN-013	Water	10/04/16 11:02
Calibration Check	SEJ0066-CCV1	100416NN-014	Water	10/04/16 11:05
PAI-27-S-160928	16I0504-04	100416NN-015	Water	10/04/16 11:35
PAI-28-S-160929	16I0504-06	100416NN-017	Water	10/04/16 11:36
PAI-27-D-160928	16I0504-05	100416NN-016	Water	10/04/16 11:36
PAI-26-S-160928	16I0504-07	100416NN-018	Water	10/04/16 11:37
PAI-26-D-160928	16I0504-08	100416NN-019	Water	10/04/16 11:37
PAI-30-S-160929	16I0504-10	100416NN-021	Water	10/04/16 11:38
RINSE-160929	16I0504-11	100416NN-022	Water	10/04/16 11:38
D-160928	16I0504-09	100416NN-020	Water	10/04/16 11:38
Calibration Check	SEJ0066-CCV2	100416NN-026	Water	10/04/16 11:40
Calibration Blank	SEJ0066-CCB2	100416NN-025	Water	10/04/16 11:40
Calibration Blank	SEJ0066-CCB3	100416NN-033	Water	10/04/16 12:24
Calibration Check	SEJ0066-CCV3	100416NN-034	Water	10/04/16 12:25

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho



x = 1.56566 y - 0.00561971
Correlation Coefficient r2 = 0.99967

Software Information
Software Name: UVProbe
Version: 2.51
Mode: Security Mode

Data Information
Filename: K:\Conventionals\Methods\Sulfide\Instrument Data \Sulfide 100416 NN.pho
Title:
Analyst: Nhan Nguyen
Date/Time: 10/04/2016 12:25:45 PM
Comments:

Instrument Information
Instrument Name: CONV-UV-2
Instrument Type: UV-1800 Series
Model (S/N): CONV-UV-2 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	Abs@650.0	Wgt.Factor	Comments
1	Std 1 (Zero)	10/04/2016	10:32:36 AM	0.000	-0.000	1.000	
2	Std 2 (0.10 mL)	10/04/2016	10:33:02 AM	0.050	0.036	1.000	
3	Std 3 (0.25 mL)	10/04/2016	10:33:24 AM	0.125	0.080	1.000	
4	Std 4 (0.50 mL)	10/04/2016	10:33:47 AM	0.250	0.167	1.000	
5	Std 5 (1.00 mL)	10/04/2016	10:34:12 AM	0.500	0.329	1.000	
6	Std 6 (2.00 mL)	10/04/2016	10:34:38 AM	1.000	0.638	1.000	
7							

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

Sample Table

	Sample ID	Date	Time	Conc	Abs@650.0	AdjConc	DF	
1	SEQ ICB	10/04/2016	10:36:28 AM	-0.006	-0.000	-0.006	1.000	
2	SEQ ICV	10/04/2016	10:36:54 AM	0.514	0.332	0.514	1.000	
3	BEJ0018 BLK1	10/04/2016	10:55:48 AM	0.019	0.016	0.019	1.000	
4	BEJ0018 BS1	10/04/2016	10:56:16 AM	0.508	0.328	0.508	1.000	
5	16I0479 01	10/04/2016	10:56:49 AM	0.096	0.065	0.096	1.000	
6	16I0479 02	10/04/2016	10:57:14 AM	0.413	0.267	4.126	10.000	
7	16I0479 03	10/04/2016	10:57:54 AM	-0.013	-0.004	-0.013	1.000	
8	16I0479 04	10/04/2016	10:58:19 AM	-0.000	0.003	-0.000	1.000	
9	16I0479 05	10/04/2016	10:58:41 AM	0.011	0.011	0.011	1.000	
10	16I0504 01	10/04/2016	11:01:14 AM	0.865	0.556	8.654	10.000	
11	16I0504 02	10/04/2016	11:01:52 AM	0.936	0.601	9.356	10.000	
12	16I0504 03	10/04/2016	11:02:21 AM	0.704	0.453	35.191	50.000	
13	SEQ CCB1	10/04/2016	11:02:56 AM	0.011	0.011	0.011	1.000	
14	SEQ CCV1	10/04/2016	11:05:59 AM	0.457	0.295	0.457	1.000	
15	16I0504 04	10/04/2016	11:35:29 AM	1.003	0.644	1.003	1.000	DILUTE 2X
16	16I0504 05	10/04/2016	11:36:12 AM	0.154	0.102	0.154	1.000	
17	16I0504 06	10/04/2016	11:36:42 AM	0.210	0.138	0.210	1.000	
18	16I0504 07	10/04/2016	11:37:06 AM	0.095	0.065	0.095	1.000	
19	16I0504 08	10/04/2016	11:37:35 AM	0.086	0.058	0.086	1.000	
20	16I0504 09	10/04/2016	11:38:01 AM	0.096	0.065	0.096	1.000	
21	16I0504 10	10/04/2016	11:38:28 AM	-0.010	-0.003	-0.010	1.000	
22	16I0504 11	10/04/2016	11:38:54 AM	-0.020	-0.009	-0.020	1.000	
23	16J0004 01	10/04/2016	11:39:18 AM	0.070	0.048	0.070	1.000	
24	16J0004 02	10/04/2016	11:39:46 AM	0.298	0.194	0.298	1.000	
25	SEQ CCB2	10/04/2016	11:40:14 AM	-0.005	0.000	-0.005	1.000	
26	SEQ CCV2	10/04/2016	11:40:40 AM	0.453	0.293	0.453	1.000	
27	16J0004 03	10/04/2016	12:06:56 PM	0.387	0.251	19.363	50.000	
28	BEJ0018 DUP1	10/04/2016	12:07:23 PM	0.371	0.241	18.557	50.000	
29	BEJ0018 MS1	10/04/2016	12:07:50 PM	0.478	0.309	23.877	50.000	.05mL STK --> 5 M
30	16J0004 04	10/04/2016	12:09:23 PM	-0.009	-0.002	-0.009	1.000	
31	16I0504 04 RE1	10/04/2016	12:09:48 PM	0.468	0.303	0.937	2.000	
32	BEJ0018 MS2	10/04/2016	12:23:54 PM	0.690	0.444	34.511	50.000	.1ML STK --> 5 ML
33	SEQ CCB3	10/04/2016	12:24:20 PM	0.010	0.010	0.010	1.000	
34	SEQ CCV3	10/04/2016	12:25:20 PM	0.516	0.333	0.516	1.000	
35								

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

[Wavelengths]
Wavelength Name: Abs@650.0
Wavelength: 650.00 nm

[Calibration Curve]
Column for Cal. Curve: Abs@650.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/L
Selected Wavelength: Abs@650.0
Calibration Equation: Conc = K1*(Abs) + K0
Zero Interception: Not Selected

[Measurement Parameters(Standard)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Measurement Parameters(Sample)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Equations]
Equation Name: AdjConc
Equation: Conc*DF
Units: mg/L

[Pass Fail]

[Method Summary]
Title: Sulfide Colorimetry
Date/Time: 01/06/2016 05:28:50 PM
Comments:
Sample Preparations:

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

SEJ0066

SULFIDE TITRATION

Buret used for titrations: **S2**

Standardization of sodium thiosulfate titrant

Thiosulfate ID: D004645 — Analyst: N/A

Bi-iodate ID: E004080 — Date & Time: 10-4-16 9:02

Stock bi-iodate = .8123 *grams to* 1000 *mL*

Normality =

Titration of bi-iodate with thiosulfate

mL bi-iodate =	3.00	3.00	3.00	
mL thiosulfate =	3.14	3.15	3.15	*nthio*
Normality thiosulfate =				

*(mL bi-iodate*normbio) / mL thiosulfate*

Normality of Iodine

Iodine ID: E000905 — Analyst:

Titration of Iodine with thiosulfate — Date & Time:

mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	3.08	3.05	3.05	*ni*
Normality iodine =				

*(mL thiosulfate*nthio) / mL iodine*

Standardization of Sodium Sulfide Stock

Stock ID = E005082 — Analyst:

Approx conc in 60 *mL* — Date & Time:

g Na2S = 0.4580 *mg /mL =*

Titration of standard with thiosulfate

mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	0.94
mL thiosulfate =	~~0.90~~	0.93	0.93	*stkconc (mg/mL)*
Sulfide (mg/mL) =	10-4-16			

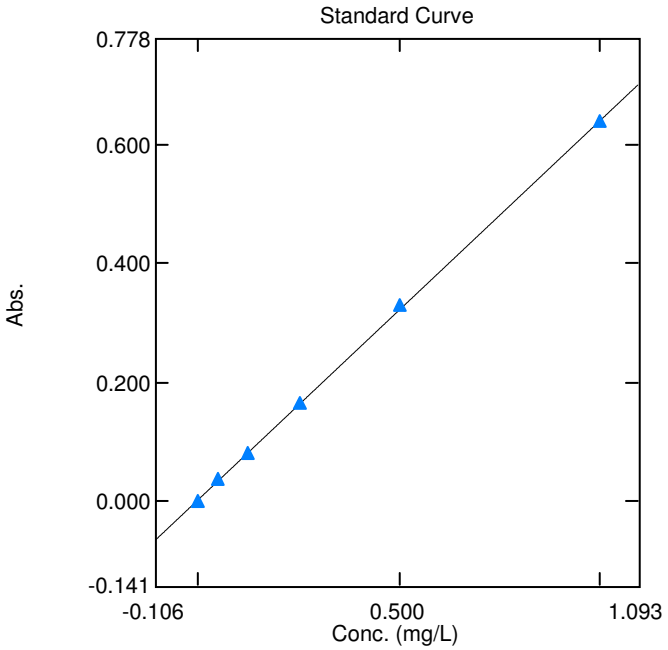
*{[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard*

mL required for for 0.025 mg/mL

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho



x = 1.56566 y - 0.00561971
Correlation Coefficient r2 = 0.99967

Software Information
Software Name: UVProbe
Version: 2.51
Mode: Security Mode

Data Information
Filename: K:\Conventionals\Methods\Sulfide\Instrument Data \Sulfide 100416 NN.pho
Title:
Analyst: Nhan Nguyen
Date/Time: 10/04/2016 12:25:45 PM
Comments:

Instrument Information
Instrument Name: CONV-UV-2
Instrument Type: UV-1800 Series
Model (S/N): CONV-UV-2 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	Abs@650.0	Wgt.Factor	Comments
1	Std 1 (Zero)	10/04/2016	10:32:36 AM	0.000	-0.000	1.000	
2	Std 2 (0.10 mL)	10/04/2016	10:33:02 AM	0.050	0.036	1.000	
3	Std 3 (0.25 mL)	10/04/2016	10:33:24 AM	0.125	0.080	1.000	
4	Std 4 (0.50 mL)	10/04/2016	10:33:47 AM	0.250	0.167	1.000	
5	Std 5 (1.00 mL)	10/04/2016	10:34:12 AM	0.500	0.329	1.000	
6	Std 6 (2.00 mL)	10/04/2016	10:34:38 AM	1.000	0.638	1.000	
7							

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

Sample Table

	Sample ID	Date	Time	Conc	Abs@650.0	AdjConc	DF	
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2	SEQ ICV	10/04/2016	10:36:54 AM	0.514	0.332	0.514	1.000	
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4	BEJ0018 BS1	10/04/2016	10:56:16 AM	0.508	0.328	0.508	1.000	
5	16I0479 01	10/04/2016	10:56:49 AM	0.096	0.065	0.096	1.000	
6	16I0479 02	10/04/2016	10:57:14 AM	0.413	0.267	4.126	10.000	
7	16I0479 03	10/04/2016	10:57:54 AM	-0.013	-0.004	-0.013	1.000	
8	16I0479 04	10/04/2016	10:58:19 AM	-0.000	0.003	-0.000	1.000	
9	16I0479 05	10/04/2016	10:58:41 AM	0.011	0.011	0.011	1.000	
10	16I0504 01	10/04/2016	11:01:14 AM	0.865	0.556	8.654	10.000	
11	16I0504 02	10/04/2016	11:01:52 AM	0.936	0.601	9.356	10.000	
12	16I0504 03	10/04/2016	11:02:21 AM	0.704	0.453	35.191	50.000	
13	SEQ CCB1	10/04/2016	11:02:56 AM	0.011	0.011	0.011	1.000	
14	SEQ CCV1	10/04/2016	11:05:59 AM	0.457	0.295	0.457	1.000	
15	16I0504 04	10/04/2016	11:35:29 AM	1.003	0.644	1.003	1.000	DILUTE 2X
16	16I0504 05	10/04/2016	11:36:12 AM	0.154	0.102	0.154	1.000	
17	16I0504 06	10/04/2016	11:36:42 AM	0.210	0.138	0.210	1.000	
18	16I0504 07	10/04/2016	11:37:06 AM	0.095	0.065	0.095	1.000	
19	16I0504 08	10/04/2016	11:37:35 AM	0.086	0.058	0.086	1.000	
20	16I0504 09	10/04/2016	11:38:01 AM	0.096	0.065	0.096	1.000	
21	16I0504 10	10/04/2016	11:38:28 AM	-0.010	-0.003	-0.010	1.000	
22	16I0504 11	10/04/2016	11:38:54 AM	-0.020	-0.009	-0.020	1.000	
23	16J0004 01	10/04/2016	11:39:18 AM	0.070	0.048	0.070	1.000	
24	16J0004 02	10/04/2016	11:39:46 AM	0.298	0.194	0.298	1.000	
25	SEQ CCB2	10/04/2016	11:40:14 AM	-0.005	0.000	-0.005	1.000	
26	SEQ CCV2	10/04/2016	11:40:40 AM	0.453	0.293	0.453	1.000	
27	16J0004 03	10/04/2016	12:06:56 PM	0.387	0.251	19.363	50.000	
28	BEJ0018 DUP1	10/04/2016	12:07:23 PM	0.371	0.241	18.557	50.000	
29	BEJ0018 MS1	10/04/2016	12:07:50 PM	0.478	0.309	23.877	50.000	.05mL STK --> 5 M
30	16J0004 04	10/04/2016	12:09:23 PM	-0.009	-0.002	-0.009	1.000	
31	16I0504 04 RE1	10/04/2016	12:09:48 PM	0.468	0.303	0.937	2.000	
32	BEJ0018 MS2	10/04/2016	12:23:54 PM	0.690	0.444	34.511	50.000	.1ML STK --> 5 ML
33	SEQ CCB3	10/04/2016	12:24:20 PM	0.010	0.010	0.010	1.000	
34	SEQ CCV3	10/04/2016	12:25:20 PM	0.516	0.333	0.516	1.000	
35								

Quantitative Measurement Report

Print Date: 10/06/2016 05:41:39 PM

Data set: K:\Conventionals\Methods\Sulfide\Instrument Data\Sulfide 100416 NN.pho

[Wavelengths]
Wavelength Name: Abs@650.0
Wavelength: 650.00 nm

[Calibration Curve]
Column for Cal. Curve: Abs@650.0
Cal. Curve Type: Multi Point
Cal. Curve Unit: mg/L
Selected Wavelength: Abs@650.0
Calibration Equation: Conc = K1*(Abs) + K0
Zero Interception: Not Selected

[Measurement Parameters(Standard)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Measurement Parameters(Sample)]
Data Acquired by: Instrument
Delay sample read: Disabled
Repeat: Disabled

[Equations]
Equation Name: AdjConc
Equation: Conc*DF
Units: mg/L

[Pass Fail]

[Method Summary]
Title: Sulfide Colorimetry
Date/Time: 01/06/2016 05:28:50 PM
Comments:
Sample Preparations:

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

Analytical Resources, Incorporated

INSTRUMENT BLANKS
SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16I0504
Client: GeoEngineers
Project: Gas Works Park Site
Instrument ID: UV1800-2
Calibration: UNASSIGNED
Sequence: SEJ0066
Date Analyzed: 10/04/16 10:36

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SEJ0066-ICB1	Sulfide	-0.006	0.03	0.050	mg/L	
SEJ0066-CCB1	Sulfide	0.011	0.03	0.050	mg/L	
SEJ0066-CCB2	Sulfide	-0.005	0.03	0.050	mg/L	
SEJ0066-CCB3	Sulfide	0.010	0.03	0.050	mg/L	

Analytical Resources, Incorporated

INITIAL AND CONTINUING CALIBRATION CHECK

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16I0504
Client: GeoEngineers
Project: Gas Works Park Site
Instrument ID: UV1800-2
Calibration: UNASSIGNED
Control Limt: +/- %
Sequence: SEJ0066

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SEJ0066-ICV1	Sulfide	0.49876	0.514	103	mg/L	SM 4500-S2 D-00
SEJ0066-CCV1	Sulfide	0.49876	0.457	91.6	mg/L	SM 4500-S2 D-00
SEJ0066-CCV2	Sulfide	0.49876	0.453	90.8	mg/L	SM 4500-S2 D-00
SEJ0066-CCV3	Sulfide	0.49876	0.516	103	mg/L	SM 4500-S2 D-00

* Values outside of QC limits

Analytical Resources, Incorporated

HOLDING TIME SUMMARY

Analysis: SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc. SDG: 16I0504

Client: GeoEngineers Project: Gas Works Park Site

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
PAI-15-S-160927 16I0504-01	09/27/16 11:00	09/30/16 16:36	10/03/16 08:20	6	7	10/04/16 11:01	7	7	
PAI-15-D-160927 16I0504-02	09/27/16 11:54	09/30/16 16:36	10/03/16 08:20	6	7	10/04/16 11:01	7	7	
PAI-25-D-160927 16I0504-03	09/27/16 09:07	09/30/16 16:36	10/03/16 08:20	6	7	10/04/16 11:02	7	7	
PAI-27-S-160928 16I0504-04	09/28/16 16:14	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:35	6	7	
PAI-27-D-160928 16I0504-05	09/28/16 16:47	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:36	6	7	
PAI-28-S-160929 16I0504-06	09/29/16 10:21	09/30/16 16:36	10/03/16 08:20	4	7	10/04/16 11:36	5	7	
PAI-26-S-160928 16I0504-07	09/28/16 10:46	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:37	6	7	
PAI-26-D-160928 16I0504-08	09/28/16 11:31	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:37	6	7	
D-160928 16I0504-09	09/28/16 00:00	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:38	6	7	
PAI-30-S-160929 16I0504-10	09/28/16 16:40	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:38	6	7	
RINSE-160929 16I0504-11	09/28/16 14:30	09/30/16 16:36	10/03/16 08:20	5	7	10/04/16 11:38	6	7	

* Indicates hold time exceedance.

Analytical Resources, Incorporated

METHOD DETECTION AND REPORTING LIMITS

SM 4500-S2 D-00

Laboratory: Analytical Resources, Inc.
SDG: 16I0504
Client: GeoEngineers
Project: Gas Works Park Site
Matrix: Water
Instrument: UV1800-2

Analyte	MDL	RL	Units
Sulfide	0.030	0.050	mg/L

ATTACHMENT 2B-3-6
Soil XRF Arsenic Data

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report
Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-13D	3.0	30.51	36	8
PAI-13D	5.0	30.51	<LOD	51
PAI-13D	6.0	30.51	<LOD	27
PAI-13D	7.0	30.51	<LOD	14
PAI-13D	8.2	30.51	<LOD	12
PAI-13D	8.8	30.51	<LOD	19
PAI-13D	7.8	30.51	<LOD	27
PAI-13D	10.0	30.51	<LOD	24
PAI-13D	11.0	30.51	<LOD	15
PAI-13D	11.2	30.51	<LOD	12
PAI-13D	12.0	30.51	<LOD	22
PAI-13D	13.0	30.51	<LOD	17
PAI-13D	15.0	30.51	<LOD	23
PAI-13D	16.0	30.51	<LOD	28
PAI-13D	18.0	30.51	72	13
PAI-13D	20.0	30.51	<LOD	48
PAI-13D	22.0	30.51	46	15
PAI-13D	23.0	30.51	<LOD	40
PAI-13D	25.0	30.51	<LOD	25
PAI-13D	27.0	30.51	<LOD	23
PAI-13D	28.0	30.51	<LOD	16
PAI-13D	30.0	30.51	29	8
PAI-13D	31.0	30.51	33	8
PAI-13D	33.0	30.51	<LOD	25
PAI-13D	34.5	30.51	77	9
PAI-14D	3.0	28.89	<LOD	45
PAI-14D	4.0	28.89	<LOD	28
PAI-14D	4.5	28.89	<LOD	30
PAI-14D	5.2	28.89	75	11
PAI-14D	5.5	28.89	<LOD	12
PAI-14D	7.0	28.89	<LOD	11
PAI-14D	10.0	28.89	36	9
PAI-14D	11.0	28.89	21	5
PAI-14D	12.0	28.89	<LOD	19
PAI-14D	13.0	28.89	<LOD	13
PAI-14D	15.0	28.89	63	7
PAI-14D	15.5	28.89	69	10
PAI-14D	20.0	28.89	95	18
PAI-14D	21.0	28.89	405	27
PAI-14D	21.9	28.89	187	14
PAI-14D	22.2	28.89	252	18
PAI-14D	22.9	28.89	497	28
PAI-14D	25.0	28.89	396	26
PAI-14D	26.0	28.89	248	23
PAI-14D	27.0	28.89	155	17
PAI-14D	30.0	28.89	<LOD	14
PAI-14D	31.0	28.89	<LOD	37
PAI-14D	32.0	28.89	30	5
PAI-14D	33.0	28.89	36	8
PAI-14D	34.0	28.89	65	9
PAI-15D	2.0	30.44	27	8
PAI-15D	3.0	30.44	72	11
PAI-15D	4.0	30.44	30	7
PAI-15D	5.0	30.44	<LOD	18
PAI-15D	6.0	30.44	<LOD	25
PAI-15D	6.5	30.44	<LOD	26
PAI-15D	7.0	30.44	21	5
PAI-15D	10.0	30.44	23	6
PAI-15D	10.5	30.44	176	9
PAI-15D	10.8	30.44	48	10
PAI-15D	11.0	30.44	51	9
PAI-15D	11.5	30.44	23	6
PAI-15D	12.4	30.44	<LOD	22
PAI-15D	15.0	30.44	103	8
PAI-15D	15.5	30.44	105	10
PAI-15D	16.0	30.44	110	11
PAI-15D	17.0	30.44	453	17
PAI-15D	17.5	30.44	278	10
PAI-15D	18.0	30.44	35	7
PAI-15D	20.0	30.44	<LOD	23
PAI-15D	21.0	30.44	<LOD	20
PAI-15D	22.0	30.44	17	5
PAI-15D	23.0	30.44	16	5
PAI-15D	24.0	30.44	<LOD	15
PAI-15D	25.0	30.44	30	6
PAI-15D	26.0	30.44	<LOD	15
PAI-15D	27.0	30.44	20	6

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report
Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-15D	28.0	30.44	<LOD	17
PAI-15D	29.0	30.44	<LOD	14
PAI-15D	30.0	30.44	<LOD	15
PAI-15D	31.0	30.44	<LOD	64
PAI-15D	31.5	30.44	22	6
PAI-15D	32.0	30.44	33	9
PAI-15D	33.0	30.44	40	7
PAI-15D	33.8	30.44	79	9
PAI-15D	34.0	30.44	90	10
PAI-16D	2.0	33.87	<LOD	25
PAI-16D	3.0	33.87	<LOD	26
PAI-16D	4.0	33.87	<LOD	30
PAI-16D	5.0	33.87	<LOD	69
PAI-16D	6.0	33.87	<LOD	43
PAI-16D	7.0	33.87	<LOD	64
PAI-16D	7.7	33.87	<LOD	41
PAI-16D	8.0	33.87	<LOD	76
PAI-16D	9.0	33.87	<LOD	22
PAI-16D	10.0	33.87	<LOD	25
PAI-16D	11.0	33.87	<LOD	17
PAI-16D	12.0	33.87	101	11
PAI-16D	13.0	33.87	148	13
PAI-16D	14.0	33.87	974	29
PAI-16D	15.0	33.87	1,406	39
PAI-16D	15.8	33.87	1,372	65
PAI-16D	16.2	33.87	248	9
PAI-16D	20.0	33.87	39	11
PAI-16D	21.0	33.87	87	17
PAI-16D	22.0	33.87	30	9
PAI-16D	25.0	33.87	<LOD	19
PAI-16D	24.0	33.87	<LOD	22
PAI-16D	25.0	33.87	<LOD	19
PAI-16D	26.0	33.87	<LOD	21
PAI-16D	27.0	33.87	<LOD	36
PAI-16D	28.0	33.87	73	18
PAI-16D	29.0	33.87	<LOD	22
PAI-16D	30.0	33.87	<LOD	20
PAI-16D	31.0	33.87	<LOD	19
PAI-16D	32.0	33.87	<LOD	24
PAI-16D	33.0	33.87	<LOD	13
PAI-17D	1.0	33.96	<LOD	28
PAI-17D	1.5	33.96	<LOD	15
PAI-17D	2.0	33.96	<LOD	25
PAI-17D	3.0	33.96	<LOD	23
PAI-17D	4.0	33.96	<LOD	30
PAI-17D	5.0	33.96	<LOD	28
PAI-17D	5.5	33.96	84	14
PAI-17D	6.5	33.96	<LOD	15
PAI-17D	7.9	33.96	427	22
PAI-17D	8.8	33.96	934	36
PAI-17D	9.0	33.96	3,779	106
PAI-17D	8.2	33.96	641	35
PAI-17D	10.0	33.96	39	10
PAI-17D	10.6	33.96	3,960	144
PAI-17D	11.0	33.96	2,512	78
PAI-17D	12.0	33.96	<LOD	24
PAI-17D	13.2	33.96	1,599	46
PAI-17D	14.0	33.96	480	27
PAI-17D	15.0	33.96	2,049	69
PAI-17D	15.8	33.96	6,678	218
PAI-17D	16.0	33.96	710	42
PAI-17D	16.8	33.96	199	13
PAI-17D	20.0	33.96	117	21
PAI-17D	21.0	33.96	75	10
PAI-17D	22.0	33.96	59	8
PAI-17D	23.0	33.96	29	8
PAI-17D	24.0	33.96	32	10
PAI-17D	25.0	33.96	74	8
PAI-17D	26.0	33.96	17	5
PAI-17D	27.0	33.96	16	5
PAI-17D	28.0	33.96	<LOD	19
PAI-17D	29.0	33.96	<LOD	19
PAI-17D	29.5	33.96	<LOD	15
PAI-17D	30.0	33.96	133	37
PAI-17D	31.0	33.96	59	13
PAI-17D	32.0	33.96	37	10
PAI-17D	33.0	33.96	42	8

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report
Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-17D	34.0	33.96	38	5
PAI-18	1.0	33.89	<LOD	38
PAI-18	2.0	33.89	31	9
PAI-18	3.0	33.89	64	9
PAI-18	5.5	33.89	30	9
PAI-18	7.0	33.89	<LOD	25
PAI-18	8.0	33.89	85	16
PAI-18	9.0	33.89	13	3
PAI-18	10.5	33.89	<LOD	58
PAI-18	11.1	33.89	79	11
PAI-18	11.5	33.89	541	27
PAI-18	12.0	33.89	941	42
PAI-18	12.5	33.89	1,217	32
PAI-18	13.0	33.89	410	19
PAI-18	13.3	33.89	393	24
PAI-18	14.0	33.89	434	47
PAI-19D	2.0	29.88	<LOD	35
PAI-19D	3.0	29.88	<LOD	42
PAI-19D	4.0	29.88	<LOD	28
PAI-19D	6.0	29.88	870	60
PAI-19D	7.0	29.88	1,131	54
PAI-19D	8.0	29.88	1,177	50
PAI-19D	9.0	29.88	43	7
PAI-19D	9.8	29.88	80	17
PAI-19D	11.0	29.88	428	40
PAI-19D	12.2	29.88	222	12
PAI-19D	12.8	29.88	<LOD	32
PAI-19D	13.0	29.88	70	13
PAI-19D	14.0	29.88	54	8
PAI-19D	15.0	29.88	98	10
PAI-19D	16.0	29.88	<LOD	27
PAI-19D	17.0	29.88	71	16
PAI-19D	18.0	29.88	28	8
PAI-19D	19.0	29.88	<LOD	18
PAI-19D	20.0	29.88	<LOD	17
PAI-19D	21.0	29.88	329	22
PAI-19D	22.0	29.88	<LOD	13
PAI-19D	23.0	29.88	<LOD	10
PAI-19D	24.0	29.88	<LOD	23
PAI-20D	3.0	29.88	<LOD	30
PAI-20D	4.0	29.88	<LOD	22
PAI-20D	5.0	29.88	<LOD	24
PAI-20D	7.0	29.88	<LOD	19
PAI-20D	8.0	29.88	<LOD	16
PAI-20D	9.2	29.88	183	16
PAI-20D	9.8	29.88	54	7
PAI-20D	11.0	29.88	<LOD	26
PAI-20D	12.0	29.88	59	10
PAI-20D	13.0	29.88	<LOD	33
PAI-20D	13.8	29.88	<LOD	34
PAI-20D	14.0	29.88	<LOD	23
PAI-20D	15.0	29.88	<LOD	28
PAI-20D	16.0	29.88	<LOD	32
PAI-20D	17.0	29.88	<LOD	15
PAI-20D	18.0	29.88	<LOD	21
PAI-20D	19.0	29.88	<LOD	39
PAI-20D	20.0	29.88	54	8
PAI-20D	22.0	29.88	<LOD	25
PAI-20D	23.0	29.88	17	4
PAI-20D	24.0	29.88	38	7
PAI-20D	25.0	29.88	<LOD	13
PAI-21	0.5	34.17	<LOD	23
PAI-21	3.0	34.17	<LOD	26
PAI-21	6.0	34.17	17	6
PAI-21	8.0	34.17	<LOD	29
PAI-21	8.4	34.17	144	14
PAI-21	9.0	34.17	161	13
PAI-21	9.5	34.17	39	11
PAI-21	10.0	34.17	75	22
PAI-21	10.8	34.17	37	7
PAI-21	11.2	34.17	270	21
PAI-21	11.5	34.17	<LOD	20
PAI-21	11.8	34.17	210	17
PAI-21	12.2	34.17	<LOD	24
PAI-21	13.5	34.17	23	7
PAI-21	14.0	34.17	168	18
PAI-21	14.6	34.17	502	31

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report
Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-21	15.0	34.17	270	20
PAI-21	16.0	34.17	116	13
PAI-21BD	2.0	34.26	<LOD	38
PAI-21BD	4.0	34.26	<LOD	45
PAI-21BD	5.5	34.26	<LOD	43
PAI-21BD	6.0	34.26	<LOD	17
PAI-21BD	8.5	34.26	<LOD	28
PAI-21BD	10.0	34.26	317	23
PAI-21BD	11.0	34.26	<LOD	94
PAI-21BD	13.0	34.26	<LOD	114
PAI-21BD	14.5	34.26	620	30
PAI-21BD	15.0	34.26	<LOD	46
PAI-21BD	16.0	34.26	<LOD	73
PAI-21BD	17.0	34.26	<LOD	20
PAI-21BD	18.0	34.26	<LOD	73
PAI-21BD	19.0	34.26	<LOD	21
PAI-21BD	22.0	34.26	<LOD	65
PAI-21BD	24.0	34.26	<LOD	29
PAI-21BD	20.0	34.26	<LOD	49
PAI-21BD	26.0	34.26	<LOD	29
PAI-21BD	27.0	34.26	<LOD	24
PAI-21BD	28.0	34.26	<LOD	24
PAI-21BD	29.0	34.26	23	7
PAI-21BD	30.0	34.26	<LOD	24
PAI-22D	0.5	32.64	<LOD	24
PAI-22D	1.0	32.64	<LOD	30
PAI-22D	2.0	32.64	<LOD	18
PAI-22D	5.6	32.64	<LOD	28
PAI-22D	6.0	32.64	<LOD	14
PAI-22D	6.5	32.64	<LOD	18
PAI-22D	7.0	32.64	307	18
PAI-22D	7.4	32.64	986	47
PAI-22D	7.6	32.64	1,272	39
PAI-22D	8.0	32.64	618	18
PAI-22D	9.0	32.64	852	27
PAI-22D	10.0	32.64	518	17
PAI-22D	10.5	32.64	309	16
PAI-22D	11.0	32.64	381	24
PAI-22D	11.8	32.64	741	47
PAI-22D	12.2	32.64	226	11
PAI-22D	13.0	32.64	758	32
PAI-22D	13.2	32.64	206	13
PAI-22D	13.5	32.64	62	6
PAI-22D	14.0	32.64	477	38
PAI-22D	15.0	32.64	172	11
PAI-22D	16.0	32.64	131	13
PAI-22D	18.0	32.64	116	15
PAI-22D	20.0	32.64	121	11
PAI-22D	21.0	32.64	123	12
PAI-22D	22.0	32.64	162	16
PAI-22D	23.0	32.64	23	6
PAI-22D	23.5	32.64	162	11
PAI-22D	24.0	32.64	29	5
PAI-22D	25.0	32.64	17	4
PAI-22D	25.5	32.64	70	9
PAI-22D	26.0	32.64	55	15
PAI-22D	27.0	32.64	52	9
PAI-22D	29.0	32.64	30	5
PAI-23D	2.0	30.17	<LOD	28
PAI-23D	3.0	30.17	<LOD	26
PAI-23D	4.0	30.17	<LOD	24
PAI-23D	7.0	30.17	24	7
PAI-23D	8.0	30.17	<LOD	31
PAI-23D	9.0	30.17	194	14
PAI-23D	9.5	30.17	84	11
PAI-23D	10.0	30.17	40	8
PAI-23D	11.0	30.17	<LOD	28
PAI-23D	11.5	30.17	53	10
PAI-23D	12.0	30.17	<LOD	19
PAI-23D	13.0	30.17	23	6
PAI-23D	14.0	30.17	60	11
PAI-23D	15.0	30.17	104	10
PAI-23D	16.0	30.17	114	13
PAI-23D	16.5	30.17	132	8
PAI-23D	17.0	30.17	58	8
PAI-23D	19.0	30.17	181	13
PAI-23D	20.0	30.17	85	9

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report
Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-23D	22.0	30.17	109	11
PAI-23D	21.0	30.17	<LOD	22
PAI-23D	24.0	30.17	<LOD	18
PAI-23D	25.0	30.17	<LOD	18
PAI-23D	26.0	30.17	102	10
PAI-23D	26.5	30.17	92	11
PAI-23D	27.0	30.17	161	14
PAI-23D	28.3	30.17	<LOD	28
PAI-23D	29.0	30.17	<LOD	17
PAI-24D	2.3	30.53	42	11
PAI-24D	2.8	30.53	35	9
PAI-24D	3.8	30.53	4,086	108
PAI-24D	4.4	30.53	64	8
PAI-24D	5.0	30.53	370	18
PAI-24D	6.0	30.53	2,527	78
PAI-24D	6.5	30.53	440	15
PAI-24D	7.0	30.53	34	10
PAI-24D	7.5	30.53	370	19
PAI-24D	10.0	30.53	51	8
PAI-24D	10.5	30.53	72	8
PAI-24D	11.0	30.53	46	10
PAI-24D	11.2	30.53	<LOD	39
PAI-24D	12.0	30.53	<LOD	26
PAI-24D	13.0	30.53	27	8
PAI-24D	14.0	30.53	<LOD	22
PAI-24D	16.0	30.53	<LOD	19
PAI-24D	17.0	30.53	34	10
PAI-24D	18.0	30.53	<LOD	30
PAI-24D	19.0	30.53	<LOD	28
PAI-24D	19.5	30.53	<LOD	18
PAI-24D	20.0	30.53	24	7
PAI-24D	20.3	30.53	43	14
PAI-24D	21.0	30.53	<LOD	18
PAI-24D	21.4	30.53	<LOD	25
PAI-24D	22.0	30.53	<LOD	16
PAI-24D	22.2	30.53	<LOD	17
PAI-24D	23.0	30.53	<LOD	21
PAI-24D	24.0	30.53	<LOD	16
PAI-26D	1.5	31.57	<LOD	21
PAI-26D	2.0	31.57	<LOD	20
PAI-26D	3.4	31.57	<LOD	26
PAI-26D	4.0	31.57	31	10
PAI-26D	5.0	31.57	38	12
PAI-26D	5.7	31.57	322	20
PAI-26D	6.0	31.57	36	7
PAI-26D	7.0	31.57	16	4
PAI-26D	10.0	31.57	43	8
PAI-26D	10.5	31.57	<LOD	25
PAI-26D	10.8	31.57	382	22
PAI-26D	11.5	31.57	295	12
PAI-26D	12.0	31.57	349	23
PAI-26D	12.3	31.57	883	23
PAI-26D	12.8	31.57	203	11
PAI-26D	13.5	31.57	147	9
PAI-26D	15.0	31.57	<LOD	22
PAI-26D	16.0	31.57	24	7
PAI-26D	17.0	31.57	<LOD	28
PAI-26D	18.0	31.57	<LOD	16
PAI-26D	19.0	31.57	<LOD	23
PAI-26D	20.0	31.57	<LOD	24
PAI-26D	21.0	31.57	23	7
PAI-26D	22.0	31.57	<LOD	20
PAI-26D	23.0	31.57	<LOD	19
PAI-26D	24.0	31.57	<LOD	21
PAI-26D	25.0	31.57	<LOD	19
PAI-26D	26.0	31.57	<LOD	26
PAI-26D	27.0	31.57	<LOD	24
PAI-26D	28.0	31.57	<LOD	23
PAI-26D	29.0	31.57	21	6
PAI-27D	5.0	25.84	<LOD	21
PAI-27D	5.7	25.84	59	15
PAI-27D	6.0	25.84	<LOD	21
PAI-27D	7.0	25.84	<LOD	22
PAI-27D	8.0	25.84	26	5
PAI-27D	8.8	25.84	92	11
PAI-27D	10.0	25.84	130	10
PAI-27D	11.0	25.84	268	20

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report
Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-27D	12.0	25.84	245	11
PAI-27D	13.0	25.84	51	7
PAI-27D	25.0	25.84	31	7
PAI-27D	26.0	25.84	26	5
PAI-27D	27.0	25.84	<LOD	19
PAI-27D	15.0	25.84	38	5
PAI-27D	16.0	25.84	87	6
PAI-27D	17.0	25.84	16	4
PAI-27D	20.0	25.84	15	4
PAI-27D	21.6	25.84	27	6
PAI-27D	22.0	25.84	22	5
PAI-27D	29.0	25.84	<LOD	12
PAI-27D	28.0	25.84	<LOD	14
PAI-28S	5.0	30.30	113	18
PAI-28S	6.0	30.30	249	26
PAI-28S	7.3	30.30	402	32
PAI-28S	10.0	30.30	819	52
PAI-28S	11.0	30.30	<LOD	79
PAI-29	3.5	33.64	40	8
PAI-29	5.0	33.64	78	10
PAI-29	6.0	33.64	<LOD	32
PAI-29	6.5	33.64	169	12
PAI-29	7.0	33.64	<LOD	20
PAI-29	8.0	33.64	<LOD	21
PAI-29	9.0	33.64	<LOD	15
PAI-29	10.0	33.64	<LOD	16
PAI-29	11.0	33.64	<LOD	23
PAI-29	11.5	33.64	<LOD	26
PAI-29	12.0	33.64	<LOD	17
PAI-29	13.3	33.64	<LOD	23
PAI-30S	1.0	33.75	79	7
PAI-30S	2.0	33.75	<LOD	29
PAI-30S	3.0	33.75	32	8
PAI-30S	8.0	33.75	<LOD	35
PAI-30S	9.0	33.75	81	11
PAI-30S	10.0	33.75	31	7
PAI-30S	10.5	33.75	34	9
PAI-30S	11.0	33.75	<LOD	18
PAI-30S	12.0	33.75	<LOD	16
PAI-30S	14.0	33.75	<LOD	21
PAI-30S	15.0	33.75	<LOD	19
PAI-30S	16.0	33.75	61	13
PAI-30S	17.0	33.75	<LOD	20
PAI-30S	18.0	33.75	<LOD	19
PAI-30S	19.0	33.75	<LOD	16
PAI-31D	1.0	29.87	<LOD	25
PAI-31D	3.0	29.87	<LOD	40
PAI-31D	4.0	29.87	<LOD	32
PAI-31D	5.5	29.87	<LOD	30
PAI-31D	6.5	29.87	<LOD	42
PAI-31D	8.0	29.87	151	29
PAI-31D	9.0	29.87	231	40
PAI-31D	10.0	29.87	128	19
PAI-31D	11.0	29.87	391	39
PAI-31D	12.0	29.87	<LOD	31
PAI-31D	15.0	29.87	<LOD	34
PAI-31D	16.0	29.87	<LOD	73
PAI-31D	16.5	29.87	<LOD	44
PAI-31D	17.0	29.87	<LOD	40
PAI-31D	18.0	29.87	<LOD	25
PAI-31D	19.5	29.87	<LOD	31
PAI-31D	20.0	29.87	<LOD	19
PAI-31D	22.0	29.87	<LOD	21
PAI-31D	22.5	29.87	<LOD	25
PAI-31D	23.0	29.87	<LOD	34
PAI-31D	24.0	29.87	<LOD	20
PAI-31D	25.0	29.87	<LOD	29
PAI-31D	26.0	29.87	<LOD	20
PAI-31D	27.0	29.87	<LOD	35
PAI-31D	28.0	29.87	<LOD	24
PAI-31D	29.0	29.87	<LOD	16
PAI-31D	29.4	29.87	<LOD	24
PAI-31D	30.0	29.87	<LOD	26
PAI-31D	31.0	29.87	<LOD	26
PAI-32D	2.5	29.72	<LOD	20
PAI-32D	4.0	29.72	34	11
PAI-32D	5.0	29.72	62	15

Attachment 6

Soil XRF Arsenic Data[1]

Play Area 2016 Supplemental Investigation Data Report

Seattle, Washington

Exploration	Depth (feet bgs)	Ground Surface Elevation (feet USACE)	XRF Soil Results	
			As[2]	As +/-[3]
			mg/kg	
PAI-32D	6.0	29.72	355	24
PAI-32D	7.5	29.72	908	29
PAI-32D	8.5	29.72	531	30
PAI-32D	9.8	29.72	595	24
PAI-32D	10.5	29.72	333	18
PAI-32D	11.8	29.72	111	13
PAI-32D	12.5	29.72	402	15
PAI-32D	13.8	29.72	294	13
PAI-32D	15.0	29.72	237	25
PAI-32D	18.5	29.72	<LOD	20
PAI-32D	20.0	29.72	26	8
PAI-32D	21.5	29.72	<LOD	19
PAI-32D	23.5	29.72	<LOD	34
PAI-32D	24.5	29.72	<LOD	47
PAI-32D	26.5	29.72	<LOD	17
PAI-32D	28.0	29.72	<LOD	22
PAI-32D	31.0	29.72	<LOD	26
PAI-33D	2.0	34.01	<LOD	32
PAI-33D	3.0	34.01	71	13
PAI-33D	4.5	34.01	49	14
PAI-33D	5.5	34.01	<LOD	37
PAI-33D	6.5	34.01	<LOD	31
PAI-33D	7.5	34.01	<LOD	37
PAI-33D	8.1	34.01	268	21
PAI-33D	9.0	34.01	899	31
PAI-33D	10.0	34.01	6,252	114
PAI-33D	10.5	34.01	3,700	142
PAI-33D	11.0	34.01	1,700	51
PAI-33D	12.0	34.01	7,614	190
PAI-33D	14.0	34.01	7,392	197
PAI-33D	16.5	34.01	170	13
PAI-33D	17.5	34.01	80	10
PAI-33D	18.0	34.01	892	38
PAI-33D	19.0	34.01	<LOD	25
PAI-33D	21.0	34.01	<LOD	19
PAI-33D	23.0	34.01	21	7
PAI-33D	24.5	34.01	<LOD	33
PAI-33D	26.0	34.01	<LOD	33
PAI-33D	28.0	34.01	<LOD	27
PAI-33D	30.5	34.01	<LOD	16
PAI-33D	32.0	34.01	<LOD	20
PAI-33D	35.0	34.01	24	6

Notes:

1. X-ray fluorescence (XRF) analyzer field screening results for arsenic. Additional metals results were recorded and are archived.
2. Less than the limit of detection (<LOD) measurements indicate concentrations are below the detection limit for the XRF analyzer; XRF detection limit for arsenic is 9 mg/kg.
3. Precision range in measurement.

bgs = below ground surface

mg/kg = milligrams per kilogram

USACE = U.S. Army Corps of Engineers (Locks) vertical datum

XRF = x-ray fluorescence