SECOND SEMI-ANNUAL 2018
GROUNDWATER MONITORING AND SOIL VAPOR REPORT

SHELL BRANDED WHOLESALE FACILITY
1035 GAMBELL STREET
ANCHORAGE, ALASKA

SAP #: 120454
PLANET ID #: 10039971
AGENCY #: 2100.26.098-23993

GES PROJECT #: 3016004

Prepared for:

SHELL OIL PRODUCTS, US
308 WILCOX NO. 101
CASTLE ROCK, CO 80104

Prepared by:

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
5046 COMMERCIAL CIRCLE, SUITE F
CONCORD, CA 94520

November 14, 2018

Sergio Postigo
Staff Hydrogeologist
PG

Mark C. Peterson
Principal Hydrogeologist
PG, CEG

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

µg/L	Micrograms per Liter
Bgs	Below Ground Surface
CRA	Conestoga-Rovers & Associates
DEC	Alaska Department of Environmental Conservation
DRO	Diesel Range Organics
DUP	Field Duplicate
EPA	United States Environmental Protection Agency
ESC	ESC Lab Sciences
GAC	Granular Activated Carbon
GES	Groundwater & Environmental Services, Inc.
GRO	Gasoline Range Organics
GTS	Groundwater Treatment System
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
MDL	Method Detection Level
MOA	Municipality of Anchorage
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PAH	Polycyclic Aromatic Hydrocarbons
PQL	Practical Quantitation Limit
RL	Laboratory Reporting Limit
RPD	Relative Percent Difference
RRO	Residual Range Organics
SOPs	Standard Operating Procedures
SOPUS	Shell Oil Products US
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank
VES	Vapor Extraction System
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

Groundwater & Environmental Services, Inc. (GES) is submitting this Second Semi-Annual 2018 Groundwater and Soil Vapor Monitoring Report to the Alaska Department of Environmental Conservation (DEC) on behalf of Shell Oil Products US (SOPUS) summarizing the October 2018 groundwater monitoring and soil vapor sampling event at 1035 Gambell Street, Anchorage, Alaska (Figure 1). The site description and background, groundwater monitoring and soil vapor sampling details, results and findings, data quality, and conclusions are presented below.

1.1 Site Description and Background

The site is an active auto repair station located in south-central Alaska, in the Municipality of Anchorage (MOA), at 1035 Gambell Street. SOPUS' involvement relates to a former Texaco-branded service station at the site until decommissioning in December 2004. The site was entered into DEC's Contaminated Site Database in September 1989.

Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed at the site during an environmental assessment in 1989. A soil and groundwater remediation system, consisting of a vapor extraction system (VES) and groundwater treatment system (GTS), was installed on the site in 1992. Wells MW-4, MW-5, and RW-13 appear to have been installed with the remediation system. The GTS was shut down indefinitely on June 11, 1998. Seven off-site monitoring wells (MW-6 through MW-12) were installed in 1992, and three more (MW-14, MW-15, and MW-16) were installed in 1995. In June 2001, well MW-17 was installed and the VES was shut down.

In January 2002, Statewide Petroleum Services removed a 550-gallon waste oil underground storage tank (UST) from the site. In December 2004, GeoEngineers supervised the station decommissioning, including removal of three 10,000-gallon gasoline USTs, associated product distribution lines, and fuel dispensers at the site. In addition, one soil sample collected from beneath the western end of the southern UST at a depth of 14 feet below ground surface (bgs) exhibited elevated benzene and total petroleum hydrocarbons (TPH) as gasoline range organics (GRO) concentrations. Two in-ground hoists were removed in July 2005.

In January 2007, Delta Environmental observed the advancement of ten soil borings at the site within and adjacent to the former UST basin and in the vicinity of the former eastern dispenser island to further evaluate and delineate soil conditions documented during the 2004 UST decommissioning. The results of the investigation indicated that the benzene concentrations in the backfill material were an order of magnitude less than originally reported.

In September and October 2012, Conestoga-Rovers & Associates (CRA) performed site characterization activities, collecting confirmation soil samples in the vicinity of the former UST pit, and monitoring wells MW-2, MW-3, and MW-11. Results indicated that soil and groundwater contamination remains both on and off site.

Currently there are 14 groundwater monitoring wells associated with the release, including both on- and off-site wells, 11 of which are scheduled to be sampled on a semi-annual basis (Figure 2). Following the March 2014 groundwater monitoring event, CRA noted that monitoring well

MW-15 had been paved over by the MOA. However, MW-15 was located during the October 2015 sampling event and included in the groundwater monitoring activities. Since the October 2015 sampling event, MW-15 has been constantly submerged underwater during rain events so GES received approval to decommission MW-15 in April 2018. Also in April 2018, one monitoring well, MW-18, and three soil vapor monitoring wells SV-1, SV-2 and SV-3 were installed.

1.2 Site Hydrogeology

Historical static groundwater depths range from approximately 2 to 19 feet below top of casing (TOC) according to groundwater data from June 2005 to present. On October 1, 2018, static groundwater depths ranged from 7.72 feet below TOC in MW-18 to 14.40 feet below TOC in RW-13. The groundwater flow direction was to the northwest at an approximate hydraulic gradient of 0.02 foot/foot (Figure 3).

2.0 GROUNDWATER MONITORING AND SAMPLING

GES gauged fluid levels in monitoring wells MW-3, MW-6, MW-9, MW-10, MW-16, MW-17, MW-18 and RW-13 on October 1, 2018. Well MW-7 was not gauged due to the presence of a large trash receptacle obstructing access to the well. GES sampled monitoring wells MW-6, MW-9, MW-10, MW-16, MW-17, and MW-18 on October 1 through 3, 2018. The wells were sampled using a bladder pump and low flow methodologies consistent with DEC guidance and GES standard operating procedures (SOPs) included as Appendix B.

Groundwater samples were submitted under chain of custody to ESC Lab Sciences (ESC), dba Pace National, and analyzed as indicated in Section 2.1, below. GES' daily field forms and well sampling forms are presented as Appendix A.

All waste purge water was filtered through a portable granular activated carbon (GAC) filter and discharged in a designated location onsite. The volume of water treated by the GAC filter during the event was recorded on the Portable GAC Volume Tracking Log. This method of purge water treatment was approved by Robert Weimer on September 29, 2016 via email.

2.1 Groundwater Analytical Methods

Collected groundwater samples were analyzed for one or more of the following:

- Total petroleum hydrocarbons (TPH) as gasoline range organics (GRO) via Alaska Series Method AK 101;
- Diesel range organics (DRO) and residual range organics (RRO) via Alaska Series Method AK 102/103;
- Volatile Organic Compounds (VOCs) (full list) via United States Environmental Protection Agency (EPA) Method 8260B;
- Polycyclic aromatic hydrocarbons (PAHs) via EPA Method 8270 D-SIM.

2.2 Groundwater Analytical Results

The following is a summary of the analytical results from April 2018:

- DRO was detected at or above the DEC's Table C cleanup level of 1,500 micrograms per liter (µg/L) in monitoring wells MW-6, MW-9, and MW-16 at concentrations ranging from 2,260 µg/L in MW-9 to 4820 µg/L in MW-6.

- RRO was detected at or above the DEC's Table C cleanup level of 1,100 micrograms per liter (µg/L) in monitoring wells MW-6 and MW-16 at concentrations of 1,170 µg/L and 1,280 µg/L, respectively.

- Benzene was detected above the DEC's Table C cleanup level of 4.6 µg/L in monitoring well MW-6 at a concentration of 12 µg/L.

- Ethylbenzene was detected above the DEC's Table C cleanup level of 15 µg/L in monitoring well MW-6 at a concentration of 33.7 µg/L.

- 1-Methylnaphthalene was detected above the DEC's Table C cleanup levels of 11 µg/L in MW-9 at concentrations of 20.6 µg/L.

- Naphthalene was detected above the DEC's Table C cleanup levels of 1.7 µg/L in monitoring wells MW-6, MW-9, and MW-16 at concentrations of 6.1 µg/L, 19.3 µg/L, and in 2.85 µg/L, respectively.

All other analytical concentrations were reported below the DEC's Table C cleanup level and/or laboratory reporting limits (RL). Current and historical groundwater analytical results are summarized in Table 1, PAHs are tabulated in Table 2, and current analytical data is shown on Figure 4. A copy of the laboratory analytical report is presented as Appendix C.

3.0 SOIL VAPOR MONITORING AND SAMPLING

On October 3, 2018, GES made attempts to collect soil vapor samples from soil vapor wells SV-1, SV-2, and SV-3. Sampling from wells SV-2 and SV-3 was cancelled due to the presence of moisture inside of the dedicated sampling tube. Soil vapor sample from SV-1 was collected following Alaska DEC guidelines for sampling soil vapor, "Vapor Intrusion Guidance for Contaminated Sites", dated November 2017.

Prior to soil vapor sampling, the initial vacuum was tested for the laboratory-provided summa canister. The laboratory-provided sampling manifold was leak tested by attaching a summa canister and checking for pressure loss for at least three minutes. When the manifold was connected to the well for sampling, a helium shroud was placed over the well, manifold and summa canister, and a helium-rich atmosphere was introduced into the shroud. The helium provided sample quality control by leak testing the system and providing data to quantitatively calculate the volume of leaked air.

The valve to the summa canister was opened after a helium atmosphere of about 5% to 10% was reached in the manifold. The summa canister was allowed to fill until the vacuum dropped

to approximately five inches of mercury. Initial and final pressures as well as helium percentage inside the manifold were noted on field sheets (Appendix A).

3.1 Soil Vapor Analytical Methods

Collected soil vapor sample was analyzed for the following:

- Volatile organic compounds (full list) via EPA Method TO-15;
- Helium by Method ASTM 1946.

3.2 Soil Vapor Analytical Results

All analytical concentrations, including helium, were reported below the DEC's Vapor Intrusion Appendix E cleanup level and/or laboratory reporting limits (RL). Current soil vapor analytical results are summarized in Table 3. A copy of the laboratory analytical report is presented as Appendix C.

4.0 DATA QUALITY

4.1 Groundwater

Groundwater & Environmental Services, Inc. (GES) reviewed the analytical data from the Shell 1035 Gambell. Anchorage Alaska (site) October 2018 water sampling event in order to determine accuracy and precision for each analysis as well as to determine overall data usability. Organic data were reviewed for holding times, method and field blank results, surrogate or system monitoring compound recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) and LCS recoveries. All data necessary to complete the data review were provided by the laboratory.

Aqueous samples from six locations were collected from the site on October 1 through 3, 2018.

The analytical results were reviewed using laboratory acceptance criteria and procedures and guidelines contained in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, revised June 2008.

The samples were sent to ESC/Pace Analytical Laboratories and analyzed by the following methodologies:

- Volatile Organic Compounds (GC/MS) by Method 8260B,
- Semi-Volatile Organic Compounds (GC) by Method AK102/103,
- Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM,
- Volatile Organic Compounds (GC) by Method 8021/AK101.

Data was overall of good quality and usable. There were no reported analytical issues. All quality control/quality assurance requirements were met.

Holding Times

All analyses were run within holding time.

Blank Results

There were no analytes reported above the reporting limit (RL) in the method blanks. There were analytes reported above the reporting limit (RL) in the trip blanks and equipment blank, but all associated data was non-detect, and the blank did not affect the data.

Laboratory Control Spike

All laboratory control spike recoveries were within laboratory-specified criteria.

Matrix Spike/

All laboratory control spike recoveries were within laboratory-specified criteria.

Preservation

Samples were collected and subsequently stored in amber sample bottles and stored at 4°C ± 2°C until prepared and analyzed. The temperature of the samples upon receipt by the laboratory was recorded within the acceptable range 2.5°C and 4.5°C. Samples were stored in appropriate bottleware with correct preservation until prepared and analyzed.

Surrogates Recoveries and Accuracy

The surrogate associated with AK103 RRO C25-C36 recovered low in all the samples. The detected and non-detect results are qualified as an estimated with a possible low bias.

Accuracy

Accuracy is a measure of the closeness of an observed value to the "true" value, e.g., theoretical or reference value, or population mean. Accuracy includes a combination of random error and systematic error (bias) that result from sampling and analytical operations. Analytical batch accuracy is measured through the analyses of recoveries in LCSs and MS/MSDs. Sample specific accuracy is measured with surrogate recovery. All surrogate recoveries and all recoveries reported in the LCS, and MS/MSD pair were within laboratory-specified criteria. Accuracy for this sampling event and report is 99%.

Sensitivity

Sensitivity is the measure of how low a concentration can be detected/reported. Sensitivity is measured using practical quantitation limits (PQLs) or reporting limits (RLs). Sensitivity is measured using PQLs or RLs with additional sensitivity achieved by reporting to the method detection limit (MDL). Analytes reported with a positive detection between the RL and the MDL are considered present, but the quantity is estimated. All analytes were reported with either the RL or MDL below the DEC clean-up levels.

Duplicate Analyses and Precision

A field duplicate (DUP-1) sample was collected and submitted blind to the laboratory for analysis. Table 2 contains the calculations and the qualifications that resulted from the precision analysis. Many of the RPDs are above accepted maximum values indicating imprecision in the sampling technique. Multiple analytical concentrations are impacted. Where the RPD exceeded maximum, data is qualified as estimated.

Precision is the distribution of a set of reported values about the mean, or the closeness of agreement between individual test results obtained under prescribed and similar conditions. Precision is best expressed in terms of RPD.

Analysis of the laboratory precision employed evaluation of laboratory spike/laboratory spike duplicate (LCS/LCSD) and matrix spike/matrix spike duplicates (MS/MSD) relative percent difference (RPD) precision calculations. The calculations returned all RPD values within laboratory provided ranges, with the exceptions listed above.

Groundwater analytical data are usable and considered definitive data and suitable for comparison to regulatory standards, with the exceptions of analytes listed in Table 1. Concentrations for this analyte in the above samples should be considered estimated.

4.2 Soil Vapor

Groundwater & Environmental Services, Inc. (GES) reviewed the analytical data from the Shell-1035 Gambell St, Anchorage, AK (site) October 2018 air sampling event in order to determine accuracy and precision for each analysis as well as to determine overall data usability.

An air sample from one location was collected from the site. The sample was sent to Pace Analytical Laboratories and analyzed by the following methodology as requested on the Chain of Custody:

- Volatile Organic Compounds (MS) by Method TO-15

The analytical results were validated using laboratory acceptance criteria, procedures and guidelines contained in the following documents: The United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines (NFG) for Organic and Inorganic Data Review (USEPA 2017 and 2016). Also referenced for procedures were the analytical EPA Method TO-15. Because there is no USEPA guidance for data validation specifically for vapor sampling, to further insure best practices the guidance published by ALS Environmental Laboratories compiled by Trihydro Corporation and Columbia Analytical Services specifically for vapor samples was also referenced. Items reviewed were sample dilutions, initial and continuing calibration, instrument performance checks, internal standards, system monitoring compounds, method blanks and equipment blanks, duplicate analyses, and oxygen percentages. Results were qualified as estimated detected (“J”), estimated high (“J+”), estimated low (“J-”), estimated non-detected (“UJ”), non-detect (“U”), or rejected/unusable (“R”), based on the guidelines referenced above.

No data was qualified due to compliance issues. Data is considered usable as reported.

Data was overall of good quality and usable. There were no reported analytical issues. All laboratory quality control/quality assurance requirements were met, unless noted below.

Blank Results

There were no analytes reported above the reporting limit (RL) that had positive detections in the samples: Below RL but above method detection limit concentrations were reported for propene and methylene chloride. Although detected in the blank, the sample reported propene in concentrations higher than the recommended 5x blank result, and was non-detect for

methylene chloride. All detections in the sample are considered representative of the sampling location. No qualifications were necessary.

Laboratory Control Spike

All laboratory control spike recoveries were within laboratory-specified criteria, with the exception of a low recovery for hexachlorobutadiene. The possible low bias qualifies all data for this analyte as estimated.

Preservation, Collection and Storage

Samples were collected appropriately and arrived at the laboratory at appropriate pressures to run the analyses without a dilution factor due to receipt issues.

Surrogates Recoveries and Accuracy

The surrogate recoveries were all within laboratory-specified ranges.

Duplicate Analyses and Precision

Precision is the distribution of a set of reported values about the mean, or the closeness of agreement between individual test results obtained under prescribed and similar conditions. Precision is best expressed in terms of relative percent difference (RPD).

Analysis of the laboratory precision employed evaluation of laboratory spike/laboratory spike duplicate (LCS/LCSD) relative percent difference (RPD) precision calculations. The calculations returned all RPD values within laboratory provided ranges.

Accuracy

Accuracy is a measure of the closeness of an observed value to the “true” value, e.g., theoretical or reference value, or population mean. Accuracy includes a combination of random error and systematic error (bias) that result from sampling and analytical operations. Analytical batch accuracy is measured through the analyses of recoveries in LCSs and MS/MSDs. Sample specific accuracy is measured with surrogate recovery. All surrogate recoveries and all recoveries reported in the LCS/LCSD pair were within laboratory-specified criteria, with the exception of the above noted Hexachlorobutadiene LCS recovery. Accuracy for this sampling event and report is 100%.

Sensitivity

Sensitivity is the measure of how low a concentration can be detected/reported. Sensitivity is measured using practical quantitation limits (PQLs) or reporting limits (RLs). RLs are lower than the commercial DEC shallow soil gas target levels with the exception of 1,2-dibromomethane.

Air analytical data are usable and considered definitive data and suitable for comparison to regulatory standards.

5.0 CONCLUSIONS

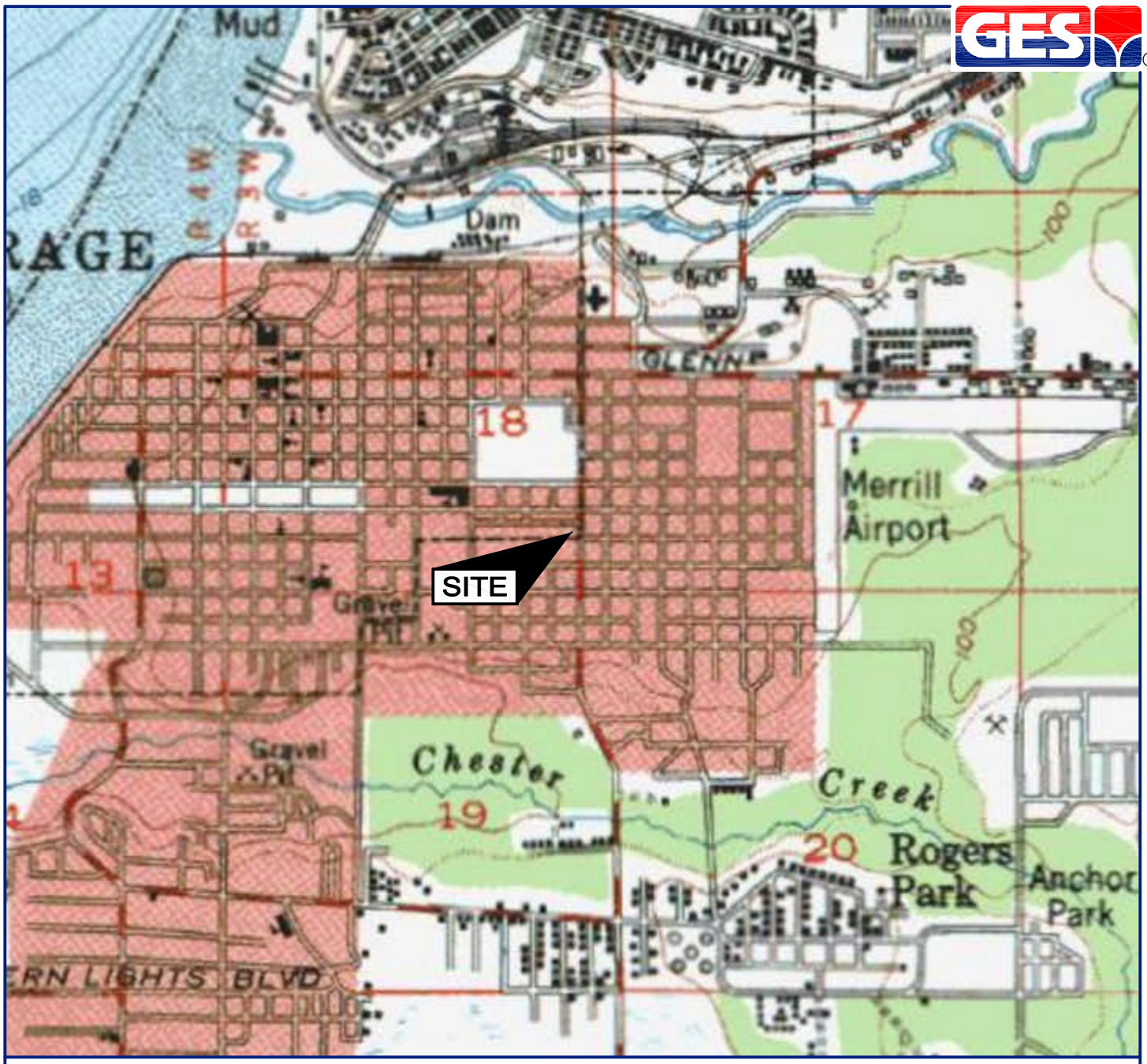
During the October 2018 groundwater monitoring event, concentrations of GRO remained below DEC Table C cleanup levels in all wells. Concentrations of benzene are still above the DEC Table C cleanup levels in one of the six wells sampled during this event. DRO concentrations

were greater than DEC's Table C cleanup levels in groundwater sampled from three monitoring wells. RRO concentrations were greater than DEC's Table C cleanup levels in groundwater sampled from two monitoring wells. The groundwater data at the site show overall stable to decreasing trends for DRO, RRO and benzene; however, the impacted groundwater plume still extends offsite to the west. Semi-annual groundwater sampling is anticipated to continue at the site.

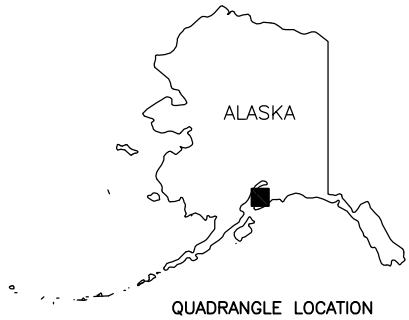
GES completed the additional collection of groundwater data for PAHs in selected wells at the site. The PAH data is available in this groundwater monitoring report in Table 2 and Figure 4. 1-Methylnaphthalene was above the DEC's Table C cleanup levels in MW-9. Naphthalene was above the DEC's Table C cleanup level in MW-6, MW-9, and MW-16. PAH analysis will be continued for these wells as part of the semi-annual sampling program.

During the October 2018 soil vapor sampling event, one soil vapor sample was taken from soil vapor well SV-1. All analytical concentrations, including helium, were reported below the DEC's Vapor Intrusion Appendix E cleanup levels. GES will continue to sample soil vapor wells in conjunction with the semi-annual groundwater sampling events.

FIGURES



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1963
ANCHORAGE A–8, ALASKA
CONTOUR INTERVAL = 50'



QUADRANGLE LOCATION

DRAFTED BY: W.G.S. (N.J.)	SITE LOCATION MAP
CHECKED BY:	SHELL OIL PRODUCTS U.S. SHELL STATION #120454 1035 GAMBELL STREET ANCHORAGE, ALASKA
REVIEWED BY:	
NORTH	Groundwater & Environmental Services, Inc. 5046 COMMERCIAL CIRCLE, SUITE F, CONCORD, CALIFORNIA 94520

SCALE IN FEET	DATE	FIGURE
0 — 2000	4–2–15	1

M:\Graphics\3000-CA-North\Shell\Alaska\120454 Anchorage\120454 Anchorage SLM.dwg, Layout1, 4/2/2015 2:55:30 PM, WShea

LEGEND

- PROPERTY BOUNDARY
- CHAIN LINK FENCE
- MONITORING WELL
- MONITORING WELL (GEOENGINEERS)
- GROUNDWATER TREATMENT SYSTEM WELL
- FORMER WELL
- SOIL VAPOR WELL

SOURCE:
DELTA CONSULTANTS, FIGURE 2, SITE MAP, DATED 05/31/2010.

Site Map

Shell Oil Products U.S.
Shell Station #120454
1035 Gambell Street
Anchorage, Alaska

Drawn
E.V.
Designed
M.W.
Approved
M.C.P.

Date
05/31/18
Figure
2

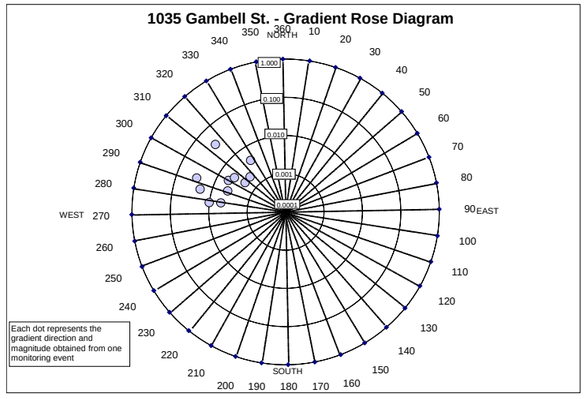
Scale In Feet (Approximate)
0 60

GESI
Groundwater & Environmental Services, Inc.

M:\Graphics\3000-CA-North\Shell\Alaska\120454 Anchorage (Gambell)\120454 Anchorage SM.dwg, B-60, EVega

LEGEND

- PROPERTY BOUNDARY
- CHAIN LINK FENCE
- MONITORING WELL
- MONITORING WELL (GEOENGINEERS)
- GROUNDWATER TREATMENT SYSTEM WELL
- FORMER WELL
- SOIL VAPOR WELL
- (88.59) GROUNDWATER ELEVATION (feet)
- GROUNDWATER CONTOUR (feet)
- DASHED WHERE INFERRED
- (NM) NOT MEASURED
- * ELEVATION NOT USED IN CONTOURING



Groundwater Elevation Contour Map
October 1, 2018

Shell Oil Products U.S.
Shell Station #120454
1035 Gambell Street
Anchorage, Alaska

Drawn
W.G.S.
Designed
M.W.
Approved
M.C.P.

Date
11/8/18
Figure
3

Scale In Feet (Approximate)
0 60

Groundwater & Environmental Services, Inc.

SOURCE:
DELTA CONSULTANTS, FIGURE 2, SITE MAP, DATED 05/31/2010.

M:\Graphics\3000-CA-North\Shell\Alaska\120454 Anchorage (Gambell)\120454 Anchorage SM.dwg

LEGEND

— — — —	PROPERTY BOUNDARY
—— x ——	CHAIN LINK FENCE
	MONITORING WELL
	MONITORING WELL (GEOENGINEERS)
	GROUNDWATER TREATMENT SYSTEM WELL
	FORMER WELL
	SOIL VAPOR WELL
MW-6	WELL IDENTIFICATION
594	TPH–GRO CONCENTRATION (ug/L)
4,820	TPH–DRO CONCENTRATION (ug/L)
1,170	TPH–RRO CONCENTRATION (ug/L)
12	BENZENE CONCENTRATION (ug/L)
4.91	TOLUENE CONCENTRATION (ug/L)
33.70	ETHYLBENZENE CONCENTRATION (ug/L)
146.0	XYLENE CONCENTRATION (ug/L)
<1.00	EDB CONCENTRATION (ug/L)
6.10	NAPHTHALENE CONCENTRATION (ug/L)
10.3	1–MeNaph CONCENTRATION (ug/L)
0.890	2–MeNaph CONCENTRATION (ug/L)
0.303	ACENAPHTHENE CONCENTRATION (ug/L)
17.593	T. PAHs CONCENTRATION (ug/L)
ug/L	MICROGRAMS PER LITER
TPH	TOTAL PETROLEUM HYDROCARBONS
GRO	GASOLINE RANGE ORGANICS
DRO	DIESEL RANGE ORGANICS
RRO	RESIDUAL RANGE ORGANICS
EDB	ETHYLENE DIBROMIDE
1–MeNaph	1–METHYLNAPHTHALENE
2–MeNaph	2–METHYLNAPHTHALENE
T.PAHs	SUM OF TOTAL POLYCYCLIC AROMATIC HYDROCARBONS
<#	WHERE AN ANALYTE IS NOT DETECTED, A REPORTING LIMIT IS GIVEN
NA	NOT ANALYZED FOR THIS PARAMETER
NS	NOT SAMPLED
J	ESTIMATED VALUE, BETWEEN LABORATORY REPORTING LIMIT AND METHOD DETECTION LIMIT

NOTE:
BOLD VALUE INDICATES RESULT ABOVE DEC TABLE C CLEANUP LEVELS.

SOURCE:
DELTA CONSULTANTS, FIGURE 2, SITE MAP, DATED 05/31/2010.

Groundwater Analytical Data Map
October 1, 2018

Shell Oil Products U.S.
Shell Station #120454
1035 Gambell Street
Anchorage, Alaska

Drawn W.G.S.
Designed M.W.
Approved M.C.P.
Date 11/6/18
Figure 4

Scale In Feet (Approximate)
0 60

GES
Groundwater & Environmental Services, Inc.

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TABLES

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
MW-1	06/17/05	106.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	09/24/05	106.25	18.63	87.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/03/05	106.25	18.87	87.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	03/24/06	106.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	06/20/06	106.25	18.96	87.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/13/06	106.25	18.65	87.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	06/17/05	101.75	14.47	87.28	--	--	--	**16**	4.1	60	90	--	--	--	--	--	--	--	--	--
MW-2	09/24/05	101.75	14.25	87.50	940	--	--	**25**	<1.0	91	13.8	--	--	--	--	--	--	--	--	--
MW-2	12/03/05	101.75	14.56	87.19	884	--	--	**15**	<0.5	92.4	26.6	--	--	--	--	--	--	--	--	--
MW-2	03/24/06	101.75	14.92	86.83	751	--	--	**9.6**	<0.5	65.5	24.7	--	--	--	--	--	--	--	--	--
MW-2	06/20/06	101.75	14.48	87.27	--	--	--	0.203	<0.5	<0.5	2.54	--	--	--	--	--	--	--	--	--
MW-2	09/26/07	101.75	14.46	87.29	<80.0	--	--	2.96	<0.500	<0.500	1.34	--	--	--	--	--	--	--	--	--
MW-2	09/26/07*	101.75	--	--	<80.0	--	--	3.07	<0.500	<0.500	1.08	--	--	--	--	--	--	--	--	--
MW-2	12/11/07	101.75	14.65	87.10	--	--	--	2.44	<0.500	<0.500	1.36	--	--	--	--	--	--	--	--	--
MW-2	03/27/08	101.75	14.90	86.85	703	--	--	**12.5**	<0.500	91.1	93.3	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-2	06/10/08	101.75	14.50	87.25	--	--	--	<0.50	<5.0	<0.50	3.1	--	--	--	--	--	--	--	--	--
MW-2	09/17/08[1]	101.75	14.30	87.45	<100	--	--	2.2	<5.0	<0.50	4.4	--	--	--	--	--	--	--	--	--
MW-2	12/04/08[4]	101.75	--	--	--	--	--	--	--	--	--			--	--	--	--	--	--	--
MW-2	03/25/09	101.75	14.87	86.88	1,000	**2,000**	**1,300**	**18**	<5.0	78	230	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-2	03/25/09*	101.75	--	--	990	1,200	480	**11**	<5.0	90	300	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-2	09/14/09	101.75	14.75	87.00	<100	<800	<200	4.9	<5.0	<0.50	2.7	--	--	--	--	--	--	--	--	--
MW-2	05/13/10	101.75	14.60	87.15	<100	**9,200**	**9,100**	1.0	<5.0	2.2	14	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-2	09/25/10	101.75	14.68	87.07	510	**3,600**	**1,100**	6.8	<5.0	54	150	--	--	--	--	--	--	--	--	--
MW-2	04/13/11	101.75	15.22	86.53	469	**3,050 J**	**4,240 J**	**20.9**	<1.00	3.40	26.4	<1.00	<1.00	<1.00	<1.00	<100	<1.00	<20.0	<1.00	--
MW-2	10/11/11	101.75	15.38	86.37	675	**6,410 J**	**3,060**	**17.1**	<1.00	76.4	49.0	--	--	--	--	--	--	--	--	--
MW-2	04/26/12	101.75	14.94	86.81	664 J	**5,730**	**6,340**	**10.6**	<1.00	<1.00	65.8	--	--	--	--	--	--	--	--	--
MW-2	10/26/12	101.75	14.06	87.69	162	**7,060 J**	**4,070**	1.56	<1.00	<1.00	11.3	--	--	--	--	--	--	--	--	--
MW-2	10/16/13	101.75	13.50	88.25	<100	**2,950**	<1,000	1.50	<1.00	5.77	18.9	**0.0988**	<1.00	--	--	--	--	--	--	2.72
MW-2	03/26/14	101.75	13.80	87.95	142	**2,220**	<1,000	1.61	<1.00	10.4	44.2	<0.0206	<1.00	--	--	--	--	--	--	3.66
MW-2	10/14/14	108.33	13.63	94.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	10/16/14	--	--	--	129	**3,340**	524 J	1.73	<1.00	7.43	31.4	<0.0206	--	<1.00	<2.00	<100	<1.00	<10.0	<1.00	2.66
MW-2	04/16/15	108.33	14.49	93.84	308	1,040	313	1.4	0.24 J	19.4	98.1	<0.020	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-2	10/22/15	108.33	14.05	94.28	<50	1,140	391	0.39 J	<1.0	0.41 J	3.9	<0.019	--	<1.0	<2.0	--	<2.0	<10	<2.0	2.2
MW-2	04/05/16	108.33	14.70	93.63	105	1,070	300	0.66 J	<1.0	3.6	11.5	<0.0098	--	<1.0	<2.0	--	<2.0	<10	<2.0	1.5
MW-2	10/02/16	108.33	14.68	93.65	<100	1,150	<380	<1.0	<1.0	2.9	16.2	<2.0	--	--	<1.0	<200	<2.0	<20	<2.0	<2.0
MW-2	04/22/17	108.33	14.95	93.38	52.4 J	**2,040**	698 J	0.327 J	<1.0	4.92	22.9	<1.00	--	<5.00	--	125	<1.00	<5.00	<1.00	--
MW-2	10/05/17	108.33	14.71	93.62	88.0 J	**2,250**	1,090	0.894	<1.00	4.54	37.1	<1.00	--	0.416 J	--	<100	<1.00	<5.00	<1.00	--
MW-2	**04/25/18**	108.33	14.86	93.47	36.1 J	1,280	736 J	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-3	06/17/05	98.67	11.49	87.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	09/24/05	98.67	11.27	87.40	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	--	--	--	--
MW-3	12/03/05	98.67	11.42	87.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	03/24/06	98.67	11.94	86.73	--	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-3	06/20/06	98.67	11.50	87.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	06/19/07	98.67	11.72	86.95	--	--	--	2.74	1.02	5.15	5.75	--	--	--	--	--	--	--	--	--
MW-3	09/26/07	98.67	11.40	87.27	--	--	--	0.765	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
MW-3	03/27/08	98.67	11.96	86.71	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-3	06/10/08	98.67	11.52	87.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	09/17/08	98.67	11.65	87.02	--	--	--	2.6	<5.0	4.3	10	--	--	--	--	--	--	--	--	--
MW-3	10/16/13	98.67	10.54	88.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	04/14/15	98.67	12.10	86.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	10/22/15	98.67	11.05	87.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	04/05/16	98.67	11.70	86.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	10/02/16	98.67	11.65	87.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	04/22/17	98.67	11.67	87.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	10/05/17	98.67	11.55	87.12	245	770 J	397 J	3.69	3.82	27.1	15.4	<1.00	--	5.56	--	<100	<1.00	<5.00	<1.00	--
MW-3	04/25/18	98.67	No access																	
MW-3	**10/01/18**	98.67	12.10	86.57	Not sampled-Insufficient water															
												--	--							
MW-4	06/17/05	99.12	12.00	87.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	09/24/05	99.12	11.84	87.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/03/05	99.12	12.00	87.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	06/20/06	99.12	12.00	87.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	10/26/12	99.12	12.21	86.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	03/26/14	99.12	No Access		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	06/17/05	102.98	15.64	87.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	09/24/05	102.98	15.45	87.53	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	--	--	--	--
MW-5	09/24/05*	102.98	--	--	150	--	--	1.1	<1.0	<1.0	<1.0	--	--	--	--	--	--	--	--	--
MW-5	12/03/05	102.98	15.70	87.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	03/24/06	102.98	16.09	86.89	--	--	--	0.46	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-5	06/20/06	102.98	15.75	87.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	06/17/05	94.30	7.42	86.88	--	--	--	**47**	9	100	175.7	--	--	--	--	--	--	--	--	--
MW-6	09/24/05	94.30	7.25	87.05	**2,200**	--	--	**54**	6.9	87	123	--	--	--	--	--	--	--	--	--
MW-6	12/03/05	94.30	7.44	86.86	**1,690**	--	--	**26.1**	4.9	50	62.7	--	--	--	--	--	--	--	--	--
MW-6	03/24/06	94.30	7.91	86.39	**2,300**	--	--	**31.4**	6.4	79.3	163	--	--	--	--	--	--	--	--	--
MW-6	06/20/06	94.30	6.43	87.87	--	--	--	3.66	0.621	9.14	36	--	--	--	--	--	--	--	--	--
MW-6	12/14/06[1]	94.30	7.41	86.89	**3,750**	--	--	**43.2**	55.8	277	578	--	--	--	--	--	--	--	--	--
MW-6	03/28/07	94.30	7.85	86.45	--	--	--	**50.5**	66.2	286	706	--	--	--	--	--	--	--	--	--
MW-6	06/19/07	94.30	7.70	86.60	**5,180**	--	--	**54.9**	24.4	250	615	--	--	--	--	--	--	--	--	--
MW-6	09/26/07	94.30	7.41	86.89	**2,680**	--	--	**45.1**	19.7	210	479	--	--	--	--	--	--	--	--	--
MW-6	12/11/07	94.30	7.64	86.66	--	--	--	**44.7**	9.14	121	183	--	--	--	--	--	--	--	--	--
MW-6	12/11/07*	94.30	--	--	--	--	--	**45.3**	9.2	121	179	--	--	--	--	--	--	--	--	--
MW-6	03/27/08	94.30	7.92	86.38	**2,170**	--	--	**22.4**	4.54	96.5	115	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-6	3/27/08*	94.30	--	--	**2,200**	--	--	**24.2**	4.57	97.4	119	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-6	06/10/08	94.30	7.50	86.80	--	--	--	**48**	22	130	110	--	--	--	--	--	--	--	--	--
MW-6	06/10/08*	94.30	--	--	**1,800**	--	--	**39**	<25	100	92	--	--	--	--	--	--	--	--	--
MW-6	09/17/08[1]	94.30	7.28	87.02	**1,900**	--	--	**31**	12	100	240	--	--	--	--	--	--	--	--	--
MW-6	09/17/08*[,1]	94.30	--	--	**1,500**	--	--	**26**	10	88	200	--	--	--	--	--	--	--	--	--
MW-6	12/04/08[5]	94.30	7.66	86.64	--	--	--	**26**	6.1	54	54	--	--	--	--	--	--	--	--	--
MW-6	03/25/09	94.30	7.89	86.41	1,000	--	--	**27**	<5.0	64	32	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-6	09/14/09	94.30	7.73	86.57	1,100	1,400	<200	**27**	<25	62	70	<0.010	<1.0	--	--	--	--	--	--	--

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SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	***Date***	***TOC***	***DTW***	***GWE***	***TPH-GRO***	***TPH-DRO***	***TPH-RRO***	***B***	***T***	***E***	***X***	***EDB***	***EDC***	***MTBE***	***DIPE***	***Ethanol***	***ETBE***	***TBA***	***TAME***	***Dissolved Lead***
			DEC Cleanup Levels		***2,200***	***1,500***	***1,100***	***4.6***	***1,100***	***15***	***190***	***0.08***	***1.7***	***140***	***NE***	***NE***	***NE***	***NE***	***NE***	***15***
					ug/L	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***
MW-6	09/14/09*	94.30	--	--	**1,400**	**1,600**	<200	**27**	<25	69	100	<0.010	<1.0	--	--	--	--	--	--	--
MW-6	05/13/10	94.30	7.66	86.64	800	**3,100**	300	**37**	<5.0	37	7.5	<1.0 [8]	1.4	<1.0	<1.0	<50	<1.0	<50	<1.0	--
MW-6	05/13/10*	94.30	--	--	850	**3,500**	310	**37**	<5.0	39	16	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-6	9/25/10[8]	94.30	7.68	86.62	990	**2,400**	500	**37**	<5.0	54	24	<1.0	<1.0	--	--	--	--	--	--	--
MW-6	04/13/11	94.30	--	--	Vault Filled with ice.		--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	10/11/11	94.30	8.38	85.92	1,070	**3,120**	**1,300**	**16.1**	3.03	35.6	28.6	<0.01983	<1.00	--	--	--	--	--	--	--
MW-6	04/26/12	94.30	7.81	86.49	--	**2,360**	<980	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	10/26/12	94.30	Frozen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	04/02/13	94.30	7.61	86.69	780	**2,470 J**	<1,900	1.46	<1.00	1.23	<3.00	<0.0100	<1.00	<1.00	<2.00	<100	<1.00	<10.0	<1.00	--
MW-6	10/16/13	94.30	6.55	87.75	**2,120 J**	**5,650 J**	<1,000	**16.7**	6.63	95.9	117	--	--	--	--	--	--	--	--	<2
MW-6	03/26/14	94.30	6.87	87.43	933	**3,780**	<1,000	**13.9**	<1.00	40.5	11.2	--	--	--	--	--	--	--	--	<2
MW-6	10/14/14	100.97	6.59	94.38	**1,390**	**6,380**	286 J	**14.1**	4.83	53.3	52.7	--	--	<1.00	<2.00	<100	<1.00	<10.0	<1.00	--
MW-6	04/15/15	100.97	7.50	93.47	577	**2,480**	411	**8.3**	0.65 J	10.7	2.0	--	--	<1.0	<2.0	--	<2.0	<10	<2.0	--
MW-6	10/22/15	100.97	7.00	93.97	399	**3,210**	717 J	**12.7**	3.5	37.2	28.6	--	--	<1.0	<2.0	--	<2.0	<10	<2.0	--
MW-6	04/04/16	100.97	7.63	93.34	453	**2,020**	338	**9.2**	1.9	12.9	27.1	--	--	<1.0	<2.0	--	<2.0	<10	<2.0	--
MW-6	10/03/16	100.97	7.62	93.35	409	**2,250**	<380	**13.1**	2.4	**24.9**	14.5	--	--	--	<1.0	<200	<2.0	<20	<2.0	--
MW-6	04/21/17	100.97	7.85	93.12	386	**4,200**	**1,150**	**12.1**	3.31	13.9	19.0	<1.00	--	3.42	--	<100	<1.00	<5.00	<1.00	--
MW-6	10/04/17	100.97	7.51	93.46	961	**4,710**	**1,590**	**26.5**	11.2	48.6	172	<1.00	--	10.0	--	<100	<1.00	<5.00	<1.00	--
MW-6	04/24/18	100.97	7.78	93.19	494	**2,590**	<800	**8.68**	1.68	**19.00**	31.8	<1.00	<1.00	<1.0	<1.0	--	--	--	--	--
MW-6	**10/02/18**	100.97	8.06	92.91	594	**4,820**	**1,170**	**12**	4.91	**33.7**	146.0	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-7	03/07/05*	93.12	--	--	820	--	--	**24**	1.4	16	5.8	--	--	--	--	--	--	--	--	--
MW-7	06/17/05	93.12	6.89	86.23	--	--	--	**54**	6.2	26	41.8	--	--	--	--	--	--	--	--	--
MW-7	06/17/05*	93.12	--	--	--	--	--	**59**	6.9	30	47.6	--	--	--	--	--	--	--	--	--
MW-7	09/24/05	93.12	6.55	86.57	1,300	--	--	**38**	4.4	19	18.4	--	--	--	--	--	--	--	--	--
MW-7	12/03/05	93.12	7.14	85.98	1,100	--	--	**17.1**	1.33	18.4	4.22	--	--	--	--	--	--	--	--	--
MW-7	03/24/06	93.12	7.53	85.59	<50.0	--	--	1.00	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-7	06/20/06	93.12	2.24	90.88	--	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-7	12/14/062	93.12	7.05	86.07	<50.0	--	--	2.31	<0.500	<0.500	<3.00	--	--	--	--	--	--	--	--	--
MW-7	12/11/07[4]	93.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	03/27/08[4]	93.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	06/10/08[4]	93.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	09/17/08[4]	93.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/04/08[4]	93.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	03/25/09[1]	93.12	7.56	85.56	<100	--	--	**12**	<5.0	<0.50	<1.5	--	--	<1.0	<1.0	910	<1.0	<50	<1.0	--
MW-7	09/14/09	93.12	6.89	86.23	270	--	--	**24**	<5.0	0.55	3.4	--	--	--	--	--	--	--	--	--
MW-7	05/13/10	93.12	6.69	86.43	<100	--	--	<0.50	<5.0	<0.50	<1.5	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-7	09/25/10	93.12	8.90	84.22	200	--	--	**21**	<5.0	2.1	5.7	--	--	--	--	--	--	--	--	--
MW-7	04/13/11	93.12	7.40	85.72	169	--	--	**5.46**	1.12	4.37	12.2	<1.00	<1.00	<1.00	<1.00	398	<1.00	<20.0	<1.00	--
MW-7	10/11/11	93.12	No access - Dumpster			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	04/26/12	93.12	No access - Dumpster			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	10/26/12	93.12	No access - Dumpster			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	04/02/13	93.12	No access - Dumpster			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	10/16/13	93.12	6.04	87.08	<100	<865 J	<1,050	<1.00	<1.00	<1.00	<2.00	--	--	--	--	--	--	--	--	<2
MW-7	03/26/14	93.12	6.54	86.58	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	03/27/14	--	--	--	<100	894	<952	<1.00	<1.00 J	<1.00 J	<3.00 J	--	--	--	--	--	--	--	--	<2

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
MW-7	10/14/14	100.01	6.18	93.83	<100	375 J	117 J	0.374 J	<1.00	<1.00	<2.00	--	--	--	--	--	--	--	--	<2
MW-7	04/15/15	100.01	7.07	92.94	<50	744	219	0.38 J	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	<1.0
MW-7	10/22/15	100.01	6.52	93.49	<50	142	140 J	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	<1.0
MW-7	04/04/16	100.01	7.28	92.73	43.4 J	649	237	1.2	<1.0	0.45 J	1.7 J	--	--	--	--	--	--	--	--	<1.0
MW-7	10/02/16	100.01	7.33	92.68	<100	449	466	<1.0	<1.0	<1.0	<3.0	--	--	--	--	--	--	--	--	<2.0
MW-7	04/21/17	100.01	7.38	92.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	10/05/17	100.01	6.72	93.29	106	1,380	751 J	3.63	1.57	1.93	15.1	<1.00	--	1.64 J	--	<100	<1.00	<5.00	<1.00	--
MW-7	**04/24/18**	No Access			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	06/17/05	94.41	7.55	86.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	09/24/05	94.41	7.25	87.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/03/05	94.41	7.60	86.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	03/24/06	94.41	7.94	86.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	03/24/06	94.41	7.32	87.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	04/02/13	94.41	9.36	85.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	06/17/05	94.11	7.61	86.50	--	--	--	**20**	11	260	591	--	--	--	--	--	--	--	--	--
MW-9	09/24/05	94.11	7.34	86.77	**6,500**	--	--	**27**	11	190	416.4	--	--	--	--	--	--	--	--	--
MW-9	12/03/05	94.11	7.65	86.46	**4,460**	--	--	**11.9**	10.5	161	420	--	--	--	--	--	--	--	--	--
MW-9	03/24/06	94.11	7.98	86.13	**3,680**	--	--	**11.3**	7.5	161	364	--	--	--	--	--	--	--	--	--
MW-9	06/20/06	94.11	6.70	87.41	--	--	--	**16.8**	2.41	21.9	13.6	--	--	--	--	--	--	--	--	--
MW-9	06/19/07	94.11	7.87	86.24	1,520	--	--	**8.58**	3.88	94.8	75.4	--	--	--	--	--	--	--	--	--
MW-9	09/26/07	94.11	7.58	86.53	**2,270**	--	--	**18.0**	10.6	212	418	--	--	--	--	--	--	--	--	--
MW-9	12/11/07	94.11	7.75	86.36	--	--	--	**21.2**	14.3	227	549	--	--	--	--	--	--	--	--	--
MW-9	03/27/08	94.11	8.08	86.03	1,930	--	--	**7.30**	3.23	91.8	113	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-9	06/10/08	94.11	7.67	86.44	--	--	--	**18**	19	190	430	--	--	--	--	--	--	--	--	--
MW-9	09/17/08[1]	94.11	7.39	86.72	**2,800**	--	--	**10**	8.0	160	470	--	--	--	--	--	--	--	--	--
MW-9	12/04/08[4]	94.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	03/25/09[4]	94.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	09/14/09	94.11	7.90	86.21	**3,800**	--	--	**15**	<5.0	160	580	--	--	--	--	--	--	--	--	--
MW-9	05/13/10	94.11	7.63	86.48	**3,200**	--	--	**15**	7.6	140	210	--	--	<10	<10	<1000	<10	<500	<10	--
MW-9	09/25/10	94.11	7.00	87.11	**3,000**	--	--	**12**	<5.0	130	360	--	--	--	--	--	--	--	--	--
MW-9	04/13/11	94.11	8.29	85.82	487	--	--	3.40	0.827 J	30.3	11.9	<1.00	<1.00	<1.00	<1.00	137	<1.00	<20.0	<1.00	--
MW-9	10/11/11	94.11	8.42	85.69	871	--	--	**5.08**	1.98	43.1	82.7	--	--	--	--	--	--	--	--	--
MW-9	04/26/12	94.11	7.75	86.36	143	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-9	10/26/12	94.11	7.30	86.81	**2,030**	--	--	3.81	<1.00	59.5	172	--	--	--	--	--	--	--	--	--
MW-9	04/02/13	94.11	7.75	86.36	**2,540**	--	--	2.93	1.21	79.8	269	--	--	--	--	--	--	--	--	--
MW-9	10/16/13	94.11	6.78	87.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	10/17/13	--	--	--	**2,700**	**2,620**	<1,000	3.01	1.49	49.3	160	0.0201	<1.00	--	--	--	--	--	--	<2
MW-9	03/26/14	94.11	7.09	87.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	03/27/14	--	--	--	**3,260**	**3,730**	<952	4.08	3.55	105	246	<0.0202	<1.00	--	--	--	--	--	--	<2
MW-9	10/14/14	100.77	6.89	93.88	**3,460**	**2,280 J**	80.7 J	3.11	2.47	58.3	203	<0.0202	--	<1.00	<2.00	<100	<1.00	<10.0	<1.00	0.327 J
MW-9	04/15/15	100.77	7.60	93.17	**2,960**	**3,820**	423	3.7	3.0	83.5	255	<0.020	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-9	10/22/15	100.77	7.13	93.64	**1,310**	**3,090**	426 J	4.3	1.7	60.9	103	<0.019	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-9	04/04/16	100.77	7.70	93.07	1,080	**3,470**	196 J	3.2	1.3	63.5	201	<0.0099	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-9	10/03/16	100.77	7.75	93.02	1,230	**7,190**	424	4.0	3.1	**51.1**	182	<2.0	--	--	<2.0	<400	<4.0	<40	<4.0	<2.0
MW-9	04/21/17	100.77	7.96	92.81	517	**3,370**	714 J	2.26	0.445 J	**16.6**	39.8	<1.00	--	0.375 J	--	<100	<1.00	<5.00	<1.00	--

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FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
MW-9	10/04/17	100.77	7.66	93.11	632	**2,610**	**1120**	2.91	3.24	**16.7**	40.8	<1.00	--	0.374 J	--	<100	<1.00	<5.00	<1.00	--
MW-9	04/24/18	96.37	7.78	88.59	554	**1,810**	<800	2.23	0.616 J	8.94	33.0	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-9	**10/01/18**	96.37	8.15	88.22	574	**2,660**	484 J	<1.00	0.843 J	8.68	28.7	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-9	**10/3/2018***	96.37	--	--	402	**2,820**	526 J	<1.00	<1.00	0.417 J	21.4	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-10	06/17/05	93.77	7.45	86.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	09/24/05	93.77	7.32	86.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	12/03/05	93.77	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	03/24/06	93.77	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	06/20/06	93.77	7.64	86.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	03/28/07	93.77	8.20	85.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	04/02/13	93.77	8.03	85.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	10/14/14	100.60	6.51	94.09	<100	--	--	<1.00	<1.00	<1.00	<2.00	--	--	--	--	--	--	--	--	--
MW-10	04/16/15	100.60	7.53	93.07	<50	--	--	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	--
MW-10	10/22/15	100.60	7.00	93.60	<50	--	--	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	--
MW-10	04/04/16	100.60	7.65	92.95	<50	--	--	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	--
MW-10	10/02/16	100.60	7.61	92.99	<100	--	--	<1.0	<1.0	<1.0	<3.0	--	--	--	--	--	--	--	--	--
MW-10	04/21/17	100.60	Ice in casing		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	10/04/17	100.60	7.30	93.30	<100	317 J	471 J	0.261 J	0.457 J	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-10	04/24/18	96.97	7.34	89.63	29.8 J	<800	<800	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-10	**10/02/18**	96.97	7.80	89.17	<100	<800	<800	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-11	06/17/05	92.85	6.93	85.92	--	--	--	**9.4**	3	<1.0	6.4	--	--	--	--	--	--	--	--	--
MW-11	09/24/05	92.85	6.75	86.10	280	--	--	**7.6**	1.8	1.2	1.2	--	--	--	--	--	--	--	--	--
MW-11	12/03/05	92.85	7.21	85.64	507	--	--	**14.3**	2.56	0.85	12.3	--	--	--	--	--	--	--	--	--
MW-11	12/03/05*	92.85	--	--	428	--	--	**14.2**	2.36	0.69	11.8	--	--	--	--	--	--	--	--	--
MW-11	03/24/06	92.85	7.70	85.15	318	--	--	**6**	0.84	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-11	06/20/06	92.85	7.12	85.73	--	--	--	4.84	1.08	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-11	03/28/07	92.85	7.82	85.03	--	--	--	**5.56**	<0.500	<0.500	<1.50	--	--	--	--	--	--	--	--	--
MW-11	06/19/07	92.85	7.10	85.75	236	--	--	**5.11**	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
MW-11	09/26/07	92.85	7.03	85.82	<80.0	--	--	1.4	1.04	<0.500	<1.00	--	--	--	--	--	--	--	--	--
MW-11	12/11/07	92.85	7.44	85.41	--	--	--	4.36	<0.500	0.697	<1.00	--	--	--	--	--	--	--	--	--
MW-11	03/27/08	92.85	7.81	85.04	233	--	--	2.55	<0.500	<0.500	<1.00	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-11	06/10/08	93.24	7.10	86.14	--	--	--	3.4	<5.0	<0.50	<1.5	--	--	--	--	--	--	--	--	--
MW-11	09/17/08[1]	93.24	6.75	86.49	<100	--	--	<0.50	<5.0	0.62	1.9	--	--	--	--	--	--	--	--	--
MW-11	12/04/08[5]	93.24	7.36	85.88	--	--	--	2.4	<5.0	0.6	2.1	--	--	--	--	--	--	--	--	--
MW-11	03/25/09[2]	93.24	7.78	85.46	--	--	--	<1.0	<5.0	<1.0	<3.0	--	--	--	--	--	--	--	--	--
MW-11	09/14/09	93.24	7.48	85.76	<100	--	--	0.86	<5.0	<0.50	1.8	--	--	--	--	--	--	--	--	--
MW-11	05/13/10	93.24	7.31	85.93	280	--	--	**44**	31	7.1	44	--	--	--	--	--	--	--	--	--
MW-11	09/25/10	93.24	7.43	85.81	170	--	--	4.0	<5.0	0.66	2.2	--	--	--	--	--	--	--	--	--
MW-11	04/13/11	93.24	8.14	85.10	137	--	--	**5.54**	0.435 J	<1.00	0.971 J	<1.00	<1.00	<1.00	<1.00	<100	<1.00	<20.0	<1.00	--
MW-11	10/11/11	93.24	8.17	85.07	<100	--	--	1.14	0.639	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-11	04/26/12	93.24	7.75	85.49	<100	--	--	1.46	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-11	10/26/12	93.24	6.75	86.49	<100	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-11	04/02/13	93.24	7.53	85.71	<100	--	--	1.44	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-11	10/16/13	93.24	6.15	87.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	03/26/14	93.24	6.67	86.57	<100	1,170	<1,000	<1.00	<1.00	<1.00	<3.00	<0.0199	<1.00	--	--	--	--	--	--	2.22

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1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
MW-11	10/14/14	100.13	6.41	93.72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	10/16/14	--	--	--	<100	1,350 J	416 J	0.729 J	<1.00	<1.00	<2.00	--	--	<1.00	<2.00	<100	<1.00	<10.0	<1.00	0.220 J
MW-11	04/15/15	100.13	7.40	92.73	69.3	1,010	567	0.77 J	<1.0	<1.0	<2.0	--	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-11	10/23/15	100.13	6.80	93.33	<50	157	329	<1.0	<1.0	<1.0	<2.0	--	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-11	04/04/16	100.13	7.90	92.23	41.5 J	393	579	0.48 J	<1.0	0.78 J	2.1	--	--	<1.0	<2.0	--	<2.0	<10	<2.0	<1.0
MW-11	10/02/16	100.13	7.45	92.68	<100	<190	<380	<1.0	<1.0	<1.0	<3.0	--	--	--	<1.0	<200	<2.0	<20	<2.0	<2.0
MW-11	04/21/17	100.13	7.76	92.37	<100	**1,500**	**1,610**	0.599	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-11	10/04/17	100.13	6.99	93.14	<100	362 J	651 J	0.240 J	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-11	**04/25/18**	96.37	7.09	89.28	62.7 J	746 J	**1,100**	0.851 J	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-12	06/17/05	95.61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	09/24/05	95.61	8.95	86.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	12/03/05	95.61	9.27	86.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	03/24/06	95.61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	06/20/06	95.61	9.34	86.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	06/17/05	100.87	13.27	87.60	--	--	--	**26**	2.6	49	71.7	--	--	--	--	--	--	--	--	--
RW-13	09/24/05	100.87	13.54	87.33	1000	--	--	**17**	1.7	46	63	--	--	--	--	--	--	--	--	--
RW-13	12/03/05	100.87	13.86	87.01	793	--	--	**13.1**	1.14	50.5	60.9	--	--	--	--	--	--	--	--	--
RW-13	03/24/06	100.87	14.23	86.64	1040	--	--	**24.4**	<0.5	54.1	50.8	--	--	--	--	--	--	--	--	--
RW-13	06/20/06	100.87	13.77	87.10	--	--	--	**15.5**	<0.5	24.1	12.5	--	--	--	--	--	--	--	--	--
RW-13	06/19/07	100.87	14.04	86.83	278	--	--	4.07	<0.500	4.11	2.99	--	--	--	--	--	--	--	--	--
RW-13	09/26/07	100.87	13.74	87.13	182	--	--	4.70	<0.500	3.20	3.70	--	--	--	--	--	--	--	--	--
RW-13	12/11/07	100.87	13.95	86.92	--	--	--	**5.18**	<0.500	3.03	4.31	--	--	--	--	--	--	--	--	--
RW-13	03/27/08[4]	100.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	06/10/08	100.87	13.76	87.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	09/17/08[1]	100.87	13.54	87.33	170	--	--	4.5	<5.0	3.9	8.5	--	--	--	--	--	--	--	--	--
RW-13	12/04/08[4]	100.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	03/25/09[4]	100.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	09/14/09	100.87	14.04	86.83	110	1,200	<200	3.2	<5.0	<0.50	<1.5	<0.010	<1.0	--	--	--	--	--	--	--
RW-13	05/13/10	100.87	13.88	86.99	<100	**3,300**	320	1.4	<5.0	0.56	1.6	<1.0 [8]	<1.0	<1.0	<1.0	<50	<1.0	<50	<1.0	--
RW-13	9/25/10[8]	100.87	13.90	86.97	<100	**3,400**	790	2.1	<5.0	<0.50	<1.5	<1.0	<1.0	--	--	--	--	--	--	--
RW-13	04/13/11	100.87	14.56	86.31	35.6 J	**3,440**	<1,000	3.18	<1.00	<1.00	<3.00	<0.02006	<1.00	<1.00	<1.00	<100	<1.00	<20.0	<1.00	--
RW-13	10/11/11	100.87	12.96	87.91	<100	**7,430**	**2,990**	2.49	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
RW-13	04/26/12	100.87	12.57	88.30	<100	**3,010**	<1,000	<1.00	<1.00	<1.00	<3.00	<0.02009	<1.00	--	--	--	--	--	--	--
RW-13	10/26/12	100.87	13.34	87.53	<100	**5,690 J**	<952	1.48	<1.00	<1.00	<3.00	<0.0201	<1.00	--	--	--	--	--	--	--
RW-13	10/16/13	100.87	12.79	88.08	<100	**9,300 J**	<2,110	1.55	<1.00	<1.00	<2.00	--	--	--	--	--	--	--	--	3.31
RW-13	03/26/14	100.87	11.41	89.46	<100	**2,410 J**	<1,000	2.05	<1.00	1.23	<3.00	--	--	--	--	--	--	--	--	<2
RW-13	10/14/14	107.53	12.87	94.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	10/16/14	--	--	--	<100	**7,390 J**	**1,160**	2.79	<1.00	<1.00	<2.00	--	--	--	--	--	--	--	--	--
RW-13	04/16/15	107.53	13.77	93.76	45.7 J	**3,470**	885 J	1.2	<1.0	0.97 J	0.73 J	--	--	--	--	--	--	--	--	--
RW-13	10/22/15	107.53	11.58	95.95	<50	**1,820**	831 J	1.2	<1.0	0.23 J	<2.0	--	--	--	--	--	--	--	--	--
RW-13	04/05/16	107.53	13.98	93.55	38.8 J	**2,010**	445	0.75 J	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	--
RW-13	10/02/16	107.53	13.97	93.56	<100	**3,090**	429	1.2	<1.0	<1.0	<3.0	--	--	--	--	--	--	--	--	--
RW-13	04/22/17	107.53	Car parked on well		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RW-13	10/05/17	107.53	13.93	93.60	31.9 J	**3130**	**1130**	0.777	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
RW-13	04/25/18	107.53	14.13	93.40	60.9 J	**2000**	<800	0.615 J	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
RW-13	**10/02/18**	107.53	14.40	93.13	Not sampled-Insufficient water											--	--	--	--	--
MW-14	06/17/05	93.35	7.03	86.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14	09/24/05	93.35	6.73	86.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14	12/03/05	93.35	7.02	86.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14	03/24/06	93.35	7.33	86.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14	06/20/06	93.35	6.62	86.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-14	05/14/18	96.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	06/17/05	92.26	6.31	85.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	09/24/05	92.26	5.82	86.44	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	--	--	--	--
MW-15	12/03/05	92.26	6.56	85.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	03/24/06	92.26	6.86	85.40	--	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-15	06/20/06	92.26	5.22	87.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	06/19/07	92.26	6.67	85.59	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
MW-15	09/26/07	92.26	6.18	86.08	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
MW-15	03/27/08[4]	92.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	06/10/08	92.46	6.27	86.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	09/17/08[4]	92.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	12/04/08	92.46	6.52	85.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	03/25/09[4]	92.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	09/14/09[1]	92.46	6.63	85.83	<100	--	--	0.57	<5.0	<0.50	<1.5	--	--	--	--	--	--	--	--	--
MW-15	05/13/10	92.46	6.40	86.06	<100	--	--	0.55	<5.0	0.59	3.7	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-15	09/25/10	92.46	6.58	85.88	<100	--	--	<0.50	<5.0	<0.50	<1.5	--	--	--	--	--	--	--	--	--
MW-15	04/13/11	92.46	--	--	Under ice, could not find.		--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	10/11/11	92.46	7.21	85.25	<100	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-15	04/26/12	92.46	5.98	86.48	<100	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-15	10/26/12	92.46	6.11	86.35	<100	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-15	04/02/13	92.46	6.66	85.80	<100	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-15	10/16/13	92.46	5.55	86.91	<100	<889	<952	<1.00	<1.00	<1.00	<2.00	--	--	--	--	--	--	--	--	<2
MW-15	03/26/14	92.46	6.09	86.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	03/27/14	--	--	--	<100	<889	<952	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	5.67
MW-15	4/14/2015[4]	92.46	Unable to locate		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	10/22/15	92.46	5.68	86.78	<50	87.0 J	157 J	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	<1.0
MW-15	04/04/16	92.46	6.35	86.11	<50	97.6	176	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	<1.0
MW-15	10/03/16	92.46	Unable to locate		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	04/22/17	92.46	6.47	85.99	<100	184 J	305 J	<0.500	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-15	10/04/17	92.46	Submerged		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-15	04/25/18	92.46	Decomissioned		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16	06/17/05	94.57	7.61	86.96	--	--	--	**10**	2.5	16	10.4	--	--	--	--	--	--	--	--	--
MW-16	09/24/05	94.57	7.35	87.22	760	--	--	**8.9**	1.5	20	5.8	--	--	--	--	--	--	--	--	--
MW-16	12/03/05	94.57	7.66	86.91	678	--	--	**9.4**	1.78	23	20.5	--	--	--	--	--	--	--	--	--
MW-16	03/24/06	94.57	8.06	86.51	730	--	--	**9.5**	<0.5	13.8	8.3	--	--	--	--	--	--	--	--	--
MW-16	03/24/06*	94.57	--	--	736	--	--	**10**	<0.5	14.5	8.3	--	--	--	--	--	--	--	--	--
MW-16	06/20/06	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
MW-16	03/28/07*	94.57	--	--	--	--	--	**48.5**	65.5	278	690	--	--	--	--	--	--	--	--	--
MW-16	6/19/07*	94.57	--	--	**5,110**	--	--	**48.0**	22.2	230	570	--	--	--	--	--	--	--	--	--
MW-16	09/26/07	94.57	7.60	86.97	321	--	--	**9.00**	0.898	16.1	4.09	--	--	--	--	--	--	--	--	--
MW-16	12/11/07	94.57	7.79	86.78	--	--	--	**15.4**	3.10	32.4	16.6	--	--	--	--	--	--	--	--	--
MW-16	03/27/08	94.57	8.09	86.48	608	--	--	**9.05**	0.860	19.3	3.15	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-16	06/10/08	94.57	7.69	86.88	--	--	--	**18**	<5.0	45	9.9	--	--	--	--	--	--	--	--	--
MW-16	09/17/08[1]	94.57	7.49	87.08	200	--	--	3.6	<5.0	3.2	2.2	--	--	--	--	--	--	--	--	--
MW-16	12/04/08[5]	94.57	7.75	86.82	--	--	--	**8.1**	<5.0	9.3	5.7	--	--	--	--	--	--	--	--	--
MW-16	12/04/08*,[5]	94.57	--	--	--	--	--	**8.4**	<5.0	9.5	5.4	--	--	--	--	--	--	--	--	--
MW-16	03/25/09	94.57	7.98	86.59	720	--	--	**15**	<5.0	38	16	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-16	09/14/09	94.57	7.89	86.68	300	<800	<200	4.6	<5.0	6.7	7.1	--	--	--	--	--	--	--	--	--
MW-16	05/13/10	94.57	7.71	86.86	1,100	**5,300**	330	**23**	<5.0	47	74	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-16	9/25/10[8]	94.57	--	--	1,100	**2,500**	590	**38**	5.0	58	39	<1.0	1.6	--	--	--	--	--	--	--
MW-16	04/13/11	94.57	8.29	86.28	265	1,370 J	<1,000	2.64	0.636 J	1.97	6.29	<1.00	<1.00	<1.00	<1.00	<100	<1.00	<20.0	<1.00	--
MW-16	04/13/11	94.57	8.29	86.28	258	**2,810 J**	<1,000	2.72	0.636 J	1.99	6.66	<1.00	<1.00	<1.00	<1.00	<100	<1.00	<20.0	<1.00	--
MW-16 DUP	10/11/11	94.57	8.49	86.08	<100	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
MW-16	10/11/11	94.57	8.49	86.08	579 J	**4,530**	<1,000	**5.81 J**	2.09 J	28.8 J	67.9 J	<0.01994	<1.00	--	--	--	--	--	--	--
MW-16 DUP	04/26/12	94.57	7.94	86.63	**2,420**	**4,980**	<990	**14.0**	2.88	43.8	199	--	--	--	--	--	--	--	--	--
MW-16	04/26/12	94.57	7.94	86.63	**2,610**	**5,630**	<1,000	**13.4**	3.24	42.0	196	--	--	--	--	--	--	--	--	--
MW-16 DUP	10/26/12	94.57	7.32	87.25	118 J	**1,560 J**	<952	<1.00	<1.00	4.87	12.6	--	--	--	--	--	--	--	--	--
MW-16	10/26/12	94.57	7.32	87.25	619 J	**2,000 J**	<952	1.37	<1.00	6.48	13.5	--	--	--	--	--	--	--	--	--
MW-16 DUP	04/02/13	94.57	7.69	86.88	314	**2,040 J**	<1,900	1.91	<1.00	3.98	<3.00	--	--	--	--	--	--	--	--	--
MW-16	04/02/13	94.57	7.69	86.88	284	**2,680 J**	<1,900	1.99	<1.00	4.11	<3.00	--	--	--	--	--	--	--	--	--
MW-16	10/15/13	--	--	--	137	**1,780 J**	<971	1.70	<1.00	8.55 J	<2.00	**0.250**	<1.00	--	--	--	--	--	--	<2
MW-16	10/15/13	--	--	--	145	**1,880**	<971	1.16	<1.00	4.62 J	<2.00	**0.233**	<1.00	--	--	--	--	--	--	<2
MW-16	10/16/13	94.57	7.64	86.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16	10/17/13	--	--	--	475	**1,810 J**	<1,000	3.67	<1.00	13.9	19.9	0.0341	<1.00	--	--	--	--	--	--	<2
MW-16 DUP	10/17/13	--	--	--	436	**2,100 J**	<980	3.30	<1.00	12.0	17.4	**0.0528 J**	<1.00	--	--	--	--	--	--	<2
MW-16	03/26/14	94.57	6.97	87.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16	03/27/14	--	--	--	268	**1,850**	<1,000	2.05	<1.00	6.57	9.24	--	--	--	--	--	--	--	--	2.01
MW-16 DUP	03/27/14	94.57	6.97	87.60	363	**1,810**	<1,000	2.28	<1.00	8.05	12.2	--	--	--	--	--	--	--	--	2.31
MW-16	10/14/14	101.21	6.83	94.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16	10/16/14	--	--	--	792	**2,910 J**	152 J	4.34	<1.24	13.9	45.5	<0.0201	--	--	--	--	--	--	--	1.56 J
MW-16	10/16/14	--	--	--	821	**3,190 J**	162 J	4.21	<1.19	13.3	43.1	<0.0205	--	--	--	--	--	--	--	1.72 J
MW-16	04/15/15	101.21	7.63	93.58	472	**2,420**	430 J	3.5	0.93 J	12.5	24.8	<0.020	--	--	--	--	--	--	--	<1.0
MW-16 DUP	04/15/15	--	--	--	459	**2,350**	351 J	3.7	0.86 J	11.8	19.8	--	--	--	--	--	--	--	--	<1.0
MW-16	10/22/15	101.21	7.14	94.07	226	**2,330**	549 J	**6.8**	0.75 J	16.4	10	<0.019	--	--	--	--	--	--	--	<1.0
MW-16 DUP	10/22/15	--	--	--	87.6	**2,790**	690 J	**6.0**	0.66 J	13.9	8.7	--	--	--	--	--	--	--	--	<1.0
MW-16	04/04/16	101.21	7.80	93.41	404	**2,180**	286 J	4.1	0.58 J	12.3	7.6	<0.0098	--	--	--	--	--	--	--	1.4
MW-16 DUP	04/04/16	--	--	--	384	**1,960**	247 J	4.0	0.59 J	12.3	7.9	--	--	--	--	--	--	--	--	1.3
MW-16	10/03/16	101.21	7.80	93.41	485	**3,470**	421	**5.5**	<1.0	9.1	5.4	<1.0	--	--	--	--	--	--	--	<2.0
MW-16 DUP	10/03/16	--	--	--	403	**3,970**	603	**5.6**	<1.0	9.1	5.5	--	--	--	--	--	--	--	--	<2.0
MW-16	04/21/17	101.21	8.04	93.17	144	**3,820**	904	3.21	0.553 J	5.62	6.93	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-16 DUP	04/21/17	--	--	--	150	**3,890**	963	2.88	<1.00	4.43	5.60	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-16	10/04/17	101.21	7.72	93.49	231	**3,670**	**1,720**	**5.20**	0.803 J	8.99	14.4	<1.00	--	0.758 J	--	<100	<1.00	<5.00	<1.00	--
MW-16 DUP	10/04/17	--	--	--	209	**1,930**	669 J	4.51	1.03	8.26	13.5	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-16	04/24/18	101.21	7.90	93.31	170	**1,780**	<800	2.95	<1.00	3.26	1.44 J	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	***Date***	***TOC***	***DTW***	***GWE***	***TPH-GRO***	***TPH-DRO***	***TPH-RRO***	***B***	***T***	***E***	***X***	***EDB***	***EDC***	***MTBE***	***DIPE***	***Ethanol***	***ETBE***	***TBA***	***TAME***	***Dissolved Lead***
			DEC Cleanup Levels		***2,200***	***1,500***	***1,100***	***4.6***	***1,100***	***15***	***190***	***0.08***	***1.7***	***140***	***NE***	***NE***	***NE***	***NE***	***NE***	***15***
					ug/L	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***	***ug/L***
MW-16 DUP	04/24/18	--	--	--	213	**1,900**	<800	3.02	<1.00	4.20	2.75 J	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-16	**10/01/18**	101.21	8.19	93.02	203	**4,460**	**1,280**	3.26	1.03	10.1	20.8	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-17	06/17/05	94.39	8.67	85.72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	09/24/05	94.39	8.47	85.92	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	--	--	--	--
MW-17	12/03/05	94.39	8.93	85.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	03/24/06	94.39	9.38	85.01	--	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
MW-17	06/20/06	94.39	8.95	85.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	12/14/06[2]	94.39	8.88	85.51	<50.0	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--	--	--	--	--
MW-17	12/14/06*[,2]	94.39	--	--	<50.0	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--	--	--	--	--
MW-17	06/19/07	94.39	9.12	85.27	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
MW-17	09/26/07	94.39	8.89	85.50	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
MW-17	12/11/07	94.39	9.06	85.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	03/27/08	94.39	9.52	84.87	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	<5.00	<1.00	<250	<1.00	<50.0	<1.00	--
MW-17	06/10/08	94.39	8.94	85.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	09/17/08	94.39	8.92	85.47	--	--	--	<0.50	<5.0	<0.50	<1.5	--	--	--	--	--	--	--	--	--
MW-17	12/04/08	94.39	9.25	85.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	03/25/09[2]	94.39	9.65	84.74	--	--	--	<1.0	<5.0	<1.0	<3.0	--	--	<1.0	<1.0	<100	<1.0	<50	<1.0	--
MW-17	09/14/09	94.39	9.42	84.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	05/13/10	94.39	9.20	85.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	09/25/10	94.39	6.58	87.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	04/13/11	94.39	9.93	84.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/11/11	94.39	10.03	84.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	04/26/12	94.39	9.49	84.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/26/12	94.39	8.57	85.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/16/13	94.39	8.05	86.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/17/13	--	--	--	<100	<769	<980	<1.00	<1.00	<1.00	<2.00	0.0133	<1.00	--	--	--	--	--	--	<2
MW-17	04/14/15	94.39	2.60[9]	91.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/22/15	94.39	DRY[10]	DRY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	04/04/16	94.39	DRY	DRY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/03/16	94.39	Well Cap Plug in Casing			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	04/21/17	94.39	Rope in Casing			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	10/05/17	94.39	8.92	85.47	<100	497 J	897 J	<0.500	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
MW-17	04/24/18	97.87	9.13	88.74	29.8 J	239 J	<800	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-17	**10/02/18**	97.87	9.50	88.37	<100	290 J	569 J	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
MW-18	04/24/18	96.27	12.30	83.97	29.9 J	552 J	<800	<1.00	<1.00	<1.00	<3.00	<1.00	0.482J	<1.00	<1.00	--	--	--	--	--
MW-18	**10/02/18**	96.27	7.72	88.55	12.5 J	875	547 J	<1.00	<1.00	<1.00	<3.00	<1.00	0.639	<1.00	<1.00	--	--	--	--	--
Trip Blank	03/07/05	--	--	--	<180	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	--	--	--	--
Trip Blank	09/24/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trip Blank	12/03/05	--	--	--	<50	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
Trip Blank	03/24/06	--	--	--	<50	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
Trip Blank	06/20/06	--	--	--	<50	--	--	<0.2	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--	--
Trip Blank	12/14/06[3]	--	--	--	<50.0	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--	--	--	--	--
Trip Blank	03/28/07	--	--	--	<50.0	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--	--	--	--	--

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*
Trip Blank	06/19/07	--	--	--	<50.0	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
Trip Blank	09/26/07	--	--	--	<80.0	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
Trip Blank	12/11/07	--	--	--	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	--	--	--	--	--	--	--
Trip Blank	03/27/08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trip Blank	06/10/08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trip Blank	09/17/08[1]	--	--	--	<100	--	--	<0.50	<5.0	<0.50	<1.5	--	--	--	--	--	--	--	--	--
Trip Blank	03/25/09	--	--	--	<100	--	--	<0.50	<5.0	<0.50	<1.5	--	--	--	--	--	--	--	--	--
Trip Blank	04/13/11	--	--	--	--	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
Trip Blank	10/11/11	--	--	--	--	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--
Trip Blank	04/15/15	--	--	--	<50	--	--	<1.0	<1.0	<1.0	<2.0	<0.020	--	--	--	--	--	--	--	--
Trip Blank	04/16/15	--	--	--	<50	--	--	<1.0	<1.0	<1.0	<2.0	<0.019	--	--	--	--	--	--	--	--
Trip Blank	10/22/15	--	--	--	<50	--	--	<1.0	<1.0	<1.0	<2.0	<0.019	--	--	--	--	--	--	--	--
Trip Blank	04/04/16	--	--	--	<50	--	--	<1.0	<1.0	<1.0	<2.0	<0.0097	--	--	--	--	--	--	--	--
Trip Blank	10/03/16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trip Blank	04/21/17	--	--	--	<100	--	--	<0.500	<1.00	0.191 J	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
Trip Blank	10/04/17	--	--	--	<100	--	--	<0.500	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
Trip Blank	10/05/17	--	--	--	<100	--	--	<0.500	<1.00	<0.500	<1.50	<1.00	--	<5.00	--	<100	<1.00	<5.00	<1.00	--
Trip Blank	04/24/18	--	--	--	32.2 J	--	--	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
Trip Blank	10/02/18	--	--	--	<100	--	--	<1.00	<1.00	<1.00	<3.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	--
D-1	10/16/13	--	--	--	265	**3,010 J**	<952	3.23	1.10	16.9	20.8	--	--	--	--	--	--	--	--	--
D-1	04/04/14	--	--	--	300	**2,520**	<943	1.20	<1.00	10.6	28.8	--	--	--	--	--	--	--	--	--

Notes:
DTW = Depth to Water in feet
GWE = Groundwater Elevation in feet relative to arbitrary benchmarks.
TOC = Top of Casing in feet relative to arbitrry benchmarks.
All results in micrograms per liter (ug/L) unless otherwise indicated.
-- = Not analyzed.
< x = sample was not detected above the laboratory method reporting limit shown
NA = Not Applicable
* = blind duplicate sample
NE = Not Established
DEC = Alaska Department of Environmental Conservation
Dissolved lead analyzed by EPA Method 6010B
BTEX = Benzene, Toluene, Ethylbenzene, and Total Xylenes; analyzed per EPA Method 8021B.
TPH-GRO = Total Petroleum Hydrocrabons (TPH) as Gasoline range orgaincs; analyzed per AK101 Method.
TPH-DRO = TPH as Diesel Range Organic, per AK102 Method.
TPH-RRO = TPH as Residual Range Organics, per AK102 Method.
MTBE = Methyl tert-butyl ether, per EPA Method 8260B.
DIPE = Di-isopropyl ether, per EPA Method 8260B.
ETBE = Ethyl tert-butyl ether, per EPA Method 8260B.
TBA = tert-Butyl alcohol, per EPA Method 8260B.
TAME = tert-Amyl Methyl Ether, per EPA Method 8260B.
EDB = Ethylene Dibromide or 1,2-Dibromoethane - analyzed by Method 8011
EDC = 1,2-Dichloroethane or 1,2-DCA - analyzed by Method 8260B
VOCs = Volatile Organic Compounds

TABLE 1
SUMMARY OF HISTORICAL GROUNDWATER ANALYTICAL DATA
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					HYDROCARBONS			*PRIMARY VOCs*						*OXYGENATES*						*Metals*
Sample ID	*Date*	*TOC*	*DTW*	*GWE*	*TPH-GRO*	*TPH-DRO*	*TPH-RRO*	*B*	*T*	*E*	*X*	*EDB*	*EDC*	*MTBE*	*DIPE*	*Ethanol*	*ETBE*	*TBA*	*TAME*	*Dissolved Lead*
			DEC Cleanup Levels		*2,200*	*1,500*	*1,100*	*4.6*	*1,100*	*15*	*190*	*0.08*	*1.7*	*140*	*NE*	*NE*	*NE*	*NE*	*NE*	*15*
					ug/L	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*

J = Estimated value; value is between the laboratory reporting limit and the laboratory method detection limit.
Concentrations in bold type following third quarter 2016 indicate the analyte was detected above DEC 18AAC75 Table C Cleanup levels (effective November 6, 2016)
Date is sample date
BTEX analysis on and after 4/14/2015 analyzed via EPA Method 8260.
[1]BTEX analysis on and after this date by ADEC AK101, unless noted otherwise
[2]BTEX analysis by EPA Method 8260B
[3]Trip blank results reported in the 4th quarter 2006 laboratory analytical report for 810 Tudor Road site.
[4]Well was inaccessible and could not be gauged or sampled.
[5]BTEX analysis by EPA Method 8021B
[6]Groundwater elevation not available; well top-of-casing was cut to repair frost heaving and has not been re-surveyed.
[7]Groundwater elevation may be inaccurate; well top-of-casing has undergone frost heaving and the top-of-casing
[8] EDB analyzed by Method 8260B
[9]Ice in well, gauging data may be inaccurate and unable to sample.
[10]Gauging log indicates well was dry, with a total depth of 4.20 feet bgs.
2018 Resurvey - Wells MW-9, MW-10, MW-11, MW-14, MW-17 and MW-18 were surveyed or resurveyed by Farpoint Land Services, LLC.

TABLE 2
GROUNDWATER ANALYTICAL DATA - PAH
FORMER TEXACO SERVICE STATION
1035 GAMBELL STREET
ANCHORAGE, ALASKA

Well ID	Sample Date	EPA Method 8270 (ug/l)																		
		1-Methylnaphthalene	2-Methylnaphthalene	2-Chloronaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
Alaska Screening Criteria																				
Cleanup Levels		**11**	**36**	**746**	**530**	**260**	**43**	**0.120**	**0.034**	**0.34**	**0.26**	**0.80**	**2.0**	**0.034**	**260**	**290**	**0.19**	**1.7**	**170**	**120**
MW-2	10/2/2016	<0.31	<0.31	--	<0.31	<0.31	<0.19	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.19	<0.19	<0.031	0.36	<0.19	<0.19
MW-3	10/5/2017	0.580	0.0248 J	<0.250	0.00845 J	0.00854 J	0.00847 J	<0.0500	<0.0500	0.0274 J	0.0130 J	<0.0500	<0.0500	<0.0500	<0.0500	0.0658	0.0101 J	0.773	0.0213 J	<0.0500
MW-6	10/3/2016	10.3	4.2	--	<0.33	<0.33	<0.21	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.21	<0.21	<0.033	**5.2**	<0.21	<0.21
MW-6	4/21/2017	3.18	2.43	<0.250	0.0900	<0.0500	<0.0500	<0.0500	<0.0500	0.00826 J	0.00893 J	<0.0500	<0.0500	0.00473 J	<0.0500	0.0196 J	0.00800J	0.982	<0.0500	<0.0500
MW-6	10/4/2017	8.06	0.623	<0.250	0.235 J	0.0272 J	0.0158 J	<0.0500	<0.0500	0.00285 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.0465 J	<0.0500	**5.31**	<0.0500	<0.0500
MW-6	4/24/2018	8.06	0.276	<0.250	0.204	0.0272 J	<0.0500	<0.0500	<0.0500	0.00334 J	0.00396 J	<0.0500	<0.0500	<0.0500	<0.0500	0.0398 J	<0.0500	**3.49**	<0.0500	<0.0500
MW-6	**10/2/2018**	10.3	0.890	<0.250	0.303	<0.0500	0.0193 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.0529	<0.0500	**6.10**	<0.0500	<0.0500
MW-9	10/3/2016	**50.8**	**47.1**	--	0.80	<0.31	<0.19	<0.031	<0.031	<0.031		<0.031	<0.031	<0.031	<0.19	<0.19	<0.031	**78.0**	<0.19	<0.19
MW-9	4/21/2017	**12.0**	1.66	<0.250	0.254	0.0372 J	0.0133 J	0.0124 J	<0.0500	0.00886 J	0.0104 J	<0.0500	<0.0500	<0.0500	<0.0500	0.214	<0.0500	**8.82**	<0.0500	<0.0500
MW-9	10/4/2017	**22.5**	13.8	<0.250	0.453	0.0649	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.310	<0.0500	**28.9**	<0.0500	<0.0500
MW-9	4/24/2018	**20.7**	11.3	<0.250	0.419	0.0663	<0.0500	<0.0500	<0.0500	0.00289 J	0.00277 J	<0.0500	<0.0500	<0.0500	<0.0500	0.275	<0.0500	**24.5**	<0.0500	<0.0500
MW-9	**10/1/2018**	**20.6**	14.3	0.0422 J	0.578	0.084	0.0113 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.420	<0.0500	**19.3**	0.0238 J	<0.0500
MW-9 DUP	**10/3/2018**	8.29	1.23	<0.250	0.462	<0.0500	0.00992 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.279	<0.0500	**6.45**	<0.0500	<0.0500
MW-16	10/3/2016	1.7	<0.32	--	0.44	<0.32	<0.20	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.032	<0.20	0.54	<0.032	1.1	<0.20	<0.20
MW-16	4/21/2017	0.213 J	0.0326 J	<0.250	0.0526	<0.0500	<0.0500	<0.0500	<0.0500	0.00434 J	0.00399 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.275	<0.0500	<0.0500
MW-16	10/4/2017	2.15	0.259	<0.250	0.289	0.0310 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.394	<0.0500	**1.80**	0.0966	<0.0500
MW-16 DUP	10/4/2017	2.17	0.269	<0.250	0.297	0.0355 J	<0.0500	<0.0500	<0.0500	0.00262 J	0.00332 J	<0.0500	<0.0500	<0.0500	<0.0500	0.411	<0.0500	**1.86**	0.101	<0.0500
MW-16	4/24/2018	1.06	0.0562 J	<0.250	0.257	0.0327 J	0.0455 J	<0.0500	<0.0500	0.00421 J	0.00397 J	<0.0500	<0.0500	<0.0500	<0.0500	0.342	<0.0500	0.515	0.132	<0.0500
MW-16	**10/1/2018**	3.27	0.785	<0.250	0.425	<0.0500	0.0668	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.536	<0.0500	**2.85**	0.211	<0.0500
RW-13	10/2/2016	<0.31	<0.31	--	<0.31	<0.31	<0.19	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.19	0.31	<0.031	<0.31	<0.19	<0.19
MW-18	4/24/2018	<0.250	<0.250	<0.250	<0.0500	0.0174 J	0.0104 J	<0.0500	<0.0500	0.00498 J	0.00465 J	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.0399 J	<0.0500	<0.0500
MW-18	**10/2/2018**	<0.250	<0.250	<0.250	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	0.0482 J	<0.0500	<0.0500

Notes:
ug/l = micrograms per liter
EPA = Environmental Protection Agency
Concentrations in bold type indicate the analyte was detected above DEC 18AAC75 Table C Cleanup levels (effective November 6, 2016).
<# = Analyte not detected above the indicated laboratory Method Detection Limit.
J = Indicates an estimated value.
DUP = Duplicate
PAH = Polycyclic aromatic hydrocarbons

TABLE 3

SUMMARY OF HISTORICAL SOIL VAPOR ANALYTICAL DATA
SHELL-BRANDED WHOLESALE FACILITY
1035 GAMBELL STREET
ANCHORAGE, ALASKA

					VOCs										FIXED GASES FROM STATIONARY SOURCES AND HELIUM			
Sample ID	***Consultant***	***Sample Location***	***Sample Date***	***Depth (ft)***	***Benzene***	***1,1-Dichloroethane***	***cis-1,2-Dichloroethene***	***trans-1,2-Dichloroethene***	***Ethylbenzene***	***PCE***	***TCE***	***Toluene***	***Vinyl Chloride***	***Xylenes (total)***	***Carbon Dioxide***	***Methane***	***Oxygen***	***Helium***
		DEC Appendix E Shallow or Subslab Commerical Soil Gas Cleanup Levels (ppbv) *			***50***	***190***	***NA***	***NA***	***113***	***265***	***16***	***58,385***	***110***	***1,013 (m,p,o)***	***NE %v/v***	***NE %v/v***	***NE %v/v***	***NE %v/v***
SV-1	GES 2018	SV-1	4/25/2018	4.5-5.0	9.31	<0.400	<0.400	<0.400	8.20	1.40	<0.400	57.7	<0.400	33.01	--	--	--	<0.100
SV-1	GES 2018	SV-1	10/3/2018	4.5-5.0	0.956	<0.400	<0.400	<0.400	10.1	0.960	<0.400	31.0	<0.400	52.4	--	--	--	<0.100
SV-2	GES 2018	SV-2	4/25/2018	4.5-5.0	1.04	<0.400	<0.400	<0.400	1.97	0.537	<0.400	7.90	<0.400	8.26	--	--	--	<0.100
SV-2	GES 2018	SV-2 [1]	10/3/2018	4.5-5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SV-3	GES 2018	SV-3	4/25/2018	4.5-5.0	1.15	<0.400	<0.400	<0.400	5.30	1.66	<0.400	17.2	<0.400	22.35	--	--	--	<0.100
SV-3	GES 2018	SV-3 [1]	10/3/2018	4.5-5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes/Abbreviations
All results shown in ppbv
DEC = Alaska Department of Environmental Conservation
VOCs = volatile organic compounds
VOCs in soil gas analyzed per EPA Method TO-15
Helium analyzed per ASTM Method 1946
ppbv = parts per billion by volume
%v/v = percent of volume by volume
NE = Not established
<x = Not detectable above reporting limit x
-- = Not analyzed
Bolded concentrations indicate the concentration value exceeded the DEC cleanup level

* ppbv values calculated from the Eurofin's website unit conversion calculator. Calculations presumed 1 atmosphere and 75 degrees Farenheit, and using the ug/m3 value from the Nov. 2017 ADEC Appendix E target levels as the concentration.
[1] Not sampled during the October 2018 sampling event due to the presence of moisture inside the sampling tubing.

APPENDIX A

Field Sheets

Groundwater & Environmental Services, Inc.

GROUNDWATER MONITORING WELL DATA

Client: Shell	Date: 10/1/18
Project No.: 3016004	Site No.: 3016004
Site Location/Address: 1035 Gambell st, Anchorage AK	Field Staff: Amy Zablocki

Well Number	Depth to Water (BTOC in feet)	Depth to Product (BTOC in feet)	Product Thickness (feet)	Product Removed (Gallons)	Measured Depth to Bottom of Well (BTOC)	Well Completion Depth (BGS)	Casing Diameter (inches)	Screen Interval
MW9	8.15	NA	Ø	NA	13.25	12.5	4"	3.4-12.8
MW16	8.19	NA	Ø	NA	12.90	unknown	4"	unknown
MW3	12.10	NA	Ø	NA	14.00	15	4"	4.5-14.5
RW13	14.40	NA	Ø	NA	24.60	unkn.	4"	unknown
MW6	8.06	NA	Ø	NA	13.4	13.6	4"	~~3-14~~ 4-13.6
MW7	—	—	blocked	by	dumpster	—	—	—
MW10	7.8	NA	Ø	NA	11.52	11.8	4"	2.4-11.8
MW18	7.72	NA	Ø	NA	13.21	15.5	2"	6-15.5
MW17	9.5	NA	Ø	NA	15.3	15.5	2"	6-15.5

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 gambell st Well No: MW16 Date: 10/1/18

Project No: 3016004 Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / (IP) Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter		Casing Volume (gal)		Total Purge Volume (gal)
	12.90	-	8.19	=	4.71	X	1 (0.04) / 2 (0.16) / (4) (0.64) / 6 (1.44)		3.01	=	3.01

PURGING DATA

Purge Method: WATERRA / BAILER / (SUB) bladder pump Purge Depth: ~~Screen~~ 9 ft Purge Rate: (gpm)

Time	1500	1506	1512	1517	1522	
Volume Purge (gal)	.5	1.25	2.0	2.5	3.25	
Temperature (C)	9.97	9.86	9.83	9.73	9.73	
pH	6.44	6.52	~~4.33~~ 6.57	6.58	6.62	
Spec.Cond.(umhos) uS/cm	416	425	433	438	441	
Turbidity/Color	clear/grayish →	→	→	→	→	
Odor (Y/N)	Y - slight →	→	→	→	→	
Dewatered (Y/N)	N	N	N	N	N	

Comments/Observations:

SAMPLING DATA

Time Sampled: 1530 Approximate Depth to Water During Sampling: 8.21 (feet)

Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
MW-16	10	VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) Disposal:

Weather Conditions: 40° cloudy

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction:

Problems Encountered During Purging and Sampling:

Comments:

BOLTS	Y	N
CAP & LOCK	Y	N
GROUT	Y	N
WELL BOX	Y	N
SECURED	Y	N

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GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Sambell St | Well No: MW3 | Date: 10/1/18

Project No: 306004 | Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / P | Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter				Casing Volume (gal)		Total Purge Volume (gal)
	14.00	-	12.10	=	1.90	X	1	2	4	6	1.22	=	1.22
							0.04	0.16	0.64	1.44			

PURGING DATA

Purge Method: WATERRA / BAILER / SUB (bladder pump) | Purge Depth: ~~Screen~~ 13 ft | Purge Rate: (gpm)

Time	1720					
Volume Purge (gal)	.25					
Temperature (C)	11.32					
pH	6.25					
Spec.Cond.(umhos) uS/cm	341					
Turbidity/Color	clear					
Odor (Y/N)	N					
Dewatered (Y/N)	Y					

Comments/Observations: poor recovery due to insufficient water for purge/sample.

SAMPLING DATA

Time Sampled: | Approximate Depth to Water During Sampling: (feet)

Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
		VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) | Disposal:

Weather Conditions:

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction:

Problems Encountered During Purging and Sampling:

Comments:

BOLTS	Y	/	N
CAP & LOCK	Y	/	N
GROUT	Y	/	N
WELL BOX	Y	/	N
SECURED	Y	/	N

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Gambell St Well No: MW9 Date: 10/1/18

Project No: 3016004 Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / IP Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter				Casing Volume (gal)		Total Purge Volume (gal)
							1	2	4	6			
	13.25	−	8.15	=	5.1	X	0.04	0.16	0.64	1.44	3.26	=	3.26

PURGING DATA

Purge Method: WATERRA / BAILER / SUB (Bladder) Purge Depth: ~~Screen~~ 9.00 ft Purge Rate: (gpm)

Time	~~1110~~	1210	1220	1225	1230	1235
Volume Purge (gal)	pump issues	1.5	2.	2.5	3	3.5
Temperature (C)		12.81	12.88	12.93	12.93	12.94
pH		6.49	6.47	6.47	6.49	6.49
Spec.Cond.(umhos)		348	350	353	354	355
Turbidity/Color		clear	clear	clear	clear	clear
Odor (Y/N)		Y	Slight	–	N	N
Dewatered (Y/N)		N	N	N	N	N

uS/cm

Comments/Observations:

PID 0.0 ppm

SAMPLING DATA

Time Sampled: 1240 Approximate Depth to Water During Sampling: 8.14 (feet)

Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
MW9	10	VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) Disposal:

Weather Conditions: misty, 35° overcast

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction: missing one 1/2" bolt

Problems Encountered During Purging and Sampling:

Comments:

BOLTS	Y	/	N
CAP & LOCK	Y	/	N
GROUT	Y	/	N
WELL BOX SECURED	Y	/	N

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GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Gambell St. Anchorage Well No: MW6 Date: 10/2/18

Project No: 3016004 Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM (IP) Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter		Casing Volume (gal)		Total Purge Volume (gal)
	13.4	-	8.06	=	5.34	X	1: 0.04; 2: 0.16; (4): 0.64; 6: 1.44		3.4	=	3.4

PURGING DATA

Purge Method: WATERRA / BAILER / (SUB) Bladder Purge Depth: ~~Screen~~ 9 ft Purge Rate: (gpm)

Time	1215	1222	1227	1232	1237	1240
Volume Purge (gal)		.75	1.5	2.25	3.0	3.5
Temperature (C)		11.27	11.24	11.21	11.06	10.99
pH		6.55	6.56	6.55	6.51	6.50
Spec.Cond.(umhos) uS/cm		488	489	490	487	485
Turbidity/Color		clear/yellow gray	→	→	→	→
Odor (Y/N)		slight	→	→	→	→
Dewatered (Y/N)		N	N	N	N	N

Comments/Observations:

SAMPLING DATA

Time Sampled: 1245 Approximate Depth to Water During Sampling: 8.08 (feet)

Comments:

0.0 PID

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
		VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) Disposal:

Weather Conditions:

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction: 2 bolts missing. 1 bent

Problems Encountered During Purging and Sampling:

Comments:

BOLTS	Y /	(N)
CAP & LOCK	Y /	N
GROUT	Y /	N
WELL BOX	Y /	N
SECURED	Y /	N

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Gambell St, Anchorage Well No: MW10 Date: 10/2/18

Project No: 3016004 Personnel: Amy Zablock.

GAUGING DATA

Water Level Measuring Method: WLM / IP Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter				Casing Volume (gal)		Total Purge Volume (gal)
	11.52	-	7.80	=	3.72	X	1	2	4	6	~~2.85~~ 2.38	=	2.38
							0.04	0.16	0.64	1.44			

PURGING DATA

Purge Method: WATERRA / BAILER / SUB Purge Depth: Screen Purge Rate: (gpm)

Time 1342	1347	1352	1356	1401	1406	
Volume Purge (gal)	0.5	1.0	1.5	2.	2.5	
Temperature (C)	11.92	11.83	11.77	11.69	11.66	
pH	5.55	5.58	5.65	5.72	5.78	
Spec.Cond (umhos) uS/cm	311	309	308	307	307	
Turbidity/Color	clear/yellow gray	→	→	→	→	
Odor (Y/N)	slight	→	→	→	→	
Dewatered (Y/N)	N	N	N	N	N	

Comments/Observations:

PID 0.0 ppm

SAMPLING DATA

Time Sampled: 1410 Approximate Depth to Water During Sampling: 7.85 (feet)

Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
MW10	8	VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) Disposal:

Weather Conditions:

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction:

Problems Encountered During Purging and Sampling:

Comments:

BOLTS	Y /	N
CAP & LOCK	Y /	N
GROUT	Y /	N
WELL BOX	Y /	N
SECURED	Y /	N

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Gambell St. Anchorage Well No: MW17 Date: 10/2/18

Project No: 3016 004 Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / IP Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter	Casing Volume (gal)		Total Purge Volume (gal)
	15.3	-	9.5	=	5.8	X	1: 0.04; 2: 0.16; 4: 0.64; 6: 1.44	0.928	=	0.928

PURGING DATA

Purge Method: WATERRA / BAILER / SUB (Bladder pump) Purge Depth: 10.25 ~~Screen~~ Purge Rate: (gpm)

Time	1708	1712	1715	1718	1722		
Volume Purge (gal)	0.25	0.50	0.75	1.0		
Temperature (C)	15.94	15.96	16.11	16.17		
pH	5.95	6.01	6.03	6.02		
Spec.Cond.(umhos) mS/cm	728	728	734	735		
Turbidity/Color	Cloudy/gray →	→	→			
Odor (Y/N)	N	N	N	N		
Dewatered (Y/N)	N	N	N	N		

Comments/Observations:

0.0 PID reading

SAMPLING DATA

Time Sampled: 1725 Approximate Depth to Water During Sampling: 9.7 (feet)

Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
MW17	8	VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) Disposal:

Weather Conditions:

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction:

Problems Encountered During Purging and Sampling:

Comments:

BOLTS Y / N

CAP & LOCK Y / N

GROUT Y / N

WELL BOX Y / N

SECURED Y / N

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Gambell St, Anchorage Well No: MW18 Date: 10/2/18

Project No: 3016.004 Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / IP Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter (1: 0.04; 2: 0.16; 4: 0.64; 6: 1.44)		Casing Volume (gal)		Total Purge Volume (gal)
	13.21	-	7.72	=	5.49	X	2		0.88	=	4x 0.88

PURGING DATA

Purge Method: WATERRA / BAILER / SUB (bladder pump) Purge Depth: ~~Screen~~ 8.5 ft Purge Rate: (gpm)

Time	1533	1541	1545	1547		
Volume Purge (gal)		0.5	0.75	1.0		
Temperature (C)		14.15	14.17	14.18		
pH		6.16	6.21	6.20		
Spec.Cond (umhos) uS/cm		1336	1348	1354		
Turbidity/Color		Cloudy/brown	→	→		
Odor (Y/N)		N	→	→		
Dewatered (Y/N)		N	N	N		

Comments/Observations:

PID 0.0 ppm

SAMPLING DATA

Time Sampled: 1550 Approximate Depth to Water During Sampling: 7.73 (feet)

Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
MW18	~~8~~ 10	VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons) Disposal:

Weather Conditions: 40° overcast

Condition of Well Box and Casing at Time of Sampling:

Well Head Conditions Requiring Correction:

Problems Encountered During Purging and Sampling:

Comments: vault flooded

BOLTS	Y / N	
CAP & LOCK	Y / N	
GROUT	Y / N	
WELL BOX	Y / N	
SECURED	Y / N	

L:\Admin\Forms\Sampling\[SED.xls]Sheet1

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Gambell St, Anchorage
Well No: ~~MW13~~ RW13 Date: 10/2/18
Project No: 3016004
Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / IP
Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)		Depth to Water (feet)		Water Column (feet)		Multiplier for Casing Diameter		Casing Volume (gal)		Total Purge Volume (gal)
	24.60	-	14.40	=	10.2	X	1: 0.04 / 2: 0.16 / 4: 0.64 / 6: 1.44		6.53	=	6.5

PURGING DATA

Purge Method: WATERRA / BAILER / SUB
Purge Depth: Screen
Purge Rate: (gpm)

Time						
Volume Purge (gal)						
Temperature (C)						
pH						
Spec.Cond.(umhos)						
Turbidity/Color						
Odor (Y/N)						
Dewatered (Y/N)						

Comments/Observations:
Stop purge attempt at 0955

SAMPLING DATA

Time Sampled:
Approximate Depth to Water During Sampling: (feet)
Comments:

Sample Number	Number of Containers	Container Type	Preservative	Volume Filled (mL or L)	Turbidity/ Color	Analysis Method
		VOA	HCL	40ML		SEE COC

Total Purge Volume: (gallons)
Disposal:
Weather Conditions:
Condition of Well Box and Casing at Time of Sampling:
Well Head Conditions Requiring Correction:
Problems Encountered During Purging and Sampling:
Comments:

BOLTS	Y / N
CAP & LOCK	Y / N
GROUT	Y / N
WELL BOX	Y / N
SECURED	Y / N

GES

SAMPLING EVENT DATASHEET

Project Name: 1035 Campbell St Anchorage Well No: SV1 Date: 10/3/18

Project No: 3016001 Personnel: Amy Zablocki

GAUGING DATA

Water Level Measuring Method: WLM / IP N/A Measuring Point Description: TOC

WELL PURGE VOLUME CALCULATION	Total Depth (feet)	Depth to Water (feet)	Vapor Column (feet)	Multiplier for Casing Diameter (1 gal = 3.88 L)				Casing Volume (gal/L)	Screen Submerged?
				1	2	4	6		
	-	=	N/A	x					
				0.04	0.16	0.64	1.44		

PURGING DATA

Purge Method: SUMMA / Vaccum Pump Initial Canister Pressure (~~PSI~~): -28" Hg

PURGE AND SAMPLING TIME AND PRESSURES		Start Time	End Time	Start Pressure (PSI)	End Pressure PSI	Comments
	Vacuum Purge	1013	1015	--- 20	--- 20	no purging
	Manifold Purge	—	—	—	—	
	Sampling	1020	1025	-28" Hg	0" Hg	

HELIUM PERCENTAGE DURING PURGE AND SAMPLE	MANIFOLD PURGE		Comments	SAMPLING		Comments
	Time	Helium %		Time	Helium %	
				1020	16.5	
				1023	16.2	
				1025	16.0	

Comments/Observations:

manifold ID # 9079, canister 8523

SAMPLING DATA

Official Time Sampled: 1025

Comments:

Sample Number	Number of Containers	Container Type and Volume	Canister #	Initial Pressure	Final Pressure	Analysis Method
SV1	1	1L SUMMA	8523	-28" Hg	0" Hg	SEE COC

Weather Conditions: 45° rainy

Condition of Well Box and Casing at Time of Sampling: OK

Well Head Conditions Requiring Correction: none

Problems Encountered During Purging and Sampling:

Comments: stopped @ -3" Hg, 3/8" valve did not fully close. FINAL 0.0" Hg

BOLTS	Y /	N
CAP & LOCK	Y /	N
GROUT	Y /	N
WELL BOX	Y /	N
SECURED	Y /	N

APPENDIX B

Standard Field Procedures For Groundwater Monitoring

TITLE: LOW FLOW GROUNDWATER SAMPLING

PURPOSE / SCOPE

This SOP describes procedures for sampling groundwater using low-flow purging and sampling techniques. The purpose is to obtain samples that are representative of existing groundwater conditions, or samples that retain the physical and chemical properties of the groundwater within an aquifer. Improper sampling and transport procedures may cause compounds of interest to be removed from or added to the sample prior to analysis.

Note: *The importance of proper and consistent field sampling methods, as well as proper documentation,* ***CANNOT BE OVER-EMPHASIZED****.*

This SOP shall be used in conjunction with an approved Health and Safety Plan (HASP). Also, consult the HASP for information on the selection and use of PPE.

REFERENCE

ASTM D5903: Guide for Planning and Preparing for a Groundwater Sampling Event

ASTM D4448: Standard Guide for Sampling Groundwater Wells

ASTM D5979: Guide for Conceptualization and Characterization of Groundwater Systems

EPA, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, (ORD/ OSWER, Washington D.C., 1996) (EPA-540/S-95/504).

EPA Region III, *Recommended Procedure For Low-Flow Purging and Sampling of Groundwater Monitoring Wells.* (Waste and Chemicals Management Division, 1997.)

RESPONSIBILITIES

4.1 Project Manager

The responsibility of the Project Manager (PM) is to ensure that all activities performed by site personnel are performed: safely; in compliance with all pertinent regulations and procedures; and with the necessary equipment and resources to accomplish the tasks described in the Work Plan.

4.2 Local Health and Safety Officer (LHSO)

The Local Health and Safety Officer (LHSO), in consultation with the Corporate HSO and State project representatives, will designate the appropriate level of personnel protective equipment (PPE) for field personnel to safely accomplish their work.

4.3 Case Manager

The Case Manager (CM) is responsible for providing Field Personnel with a sampling or work plan/schedule. In addition, the PM or CM will provide field personnel with enough information to perform the work safely and correctly. This information should include the operational and safety procedures that are applicable to the work being performed.

4.4 Field Personnel

Field personnel are responsible for the safe completion of assigned tasks as described in the SOPs, Health and Safety Plan (HASP) and appropriate site-specific work plans and procedures. They are required to document the work performed and to alert their immediate supervisors of any variances from procedures established in the above documents.

EQUIPMENT / MATERIALS

A basic checklist of suggested equipment and supplies needed to implement this SOP include, but is not limited to:

- Personnel protective equipment as outlined in the site-specific HASP
- Adjustable rate, positive displacement pump (low flow-rate stainless steel submersible pump recommended) or pre-cleaned stainless steel bladder pump
- Electronic, audible (or visual identification) water level meter (0.01 feet accuracy), or interface probe if needed
- Teflon or Teflon-lined polyethylene tubing (3/8 to 1/2 inch, inside diameter)
- Flow measurement supplies (graduated cylinder and stop watch).
- Properly sized generator to operate pump

- In-line flow-through cell capable of measuring pH, specific conductance, and temperature
- Nylon cable-ties
- Decontamination supplies
- Distilled water
- Polyethylene sheeting/cloth/paper towels/garbage bags
- Transportable, purged water storage container
- Well construction log details and historical groundwater gauging data
- Photoionization detector (PID)
- Secondary containment for the flow-through cell
- Field book
- Well Purging Record Form

***Note**: Gas powered equipment at sampling sites require special care to ensure that GES staff handling these units do not contaminate down-hole equipment. Frequent disposable glove changes are required, as well as strict separation of sampling crew tasks (e.g., those handling pumps and hoses do not conduct fueling activities).*

PREPARATION

***Note:** Pre-plan the schedule of sampling activities so that sample collection progresses from "clean" to "dirty" areas to minimize the potential for cross contamination.*

PROCEDURE

Prior to low-flow purging and sampling activities, all measuring devices must be calibrated daily in accordance with equipment vendor recommendations and recorded on a calibration log sheet. Purging and sampling activities should occur in a progression from the "cleanest" to the "dirtiest" well.

7.1 Well Set-Up Activities

The following steps are required to properly set up for sampling:

1. Properly identify and inspect each well.
2. Wear appropriate PPE during set-up activities.

3. Place a sheet of polyethylene adjacent to the well to keep sampling and monitoring equipment from touching the ground.
4. Remove the well cap slowly (positive pressure inside may blow cap off).
5. Measure the VOC concentration at the top of the casing and in the breathing zone using a PID—record reading in field book.
6. Measure and record the depth to water (to within 0.01 feet) using a water level meter or interface probe, if applicable (the water level measurement should be taken from a permanent reference point scribed on top of the well casing).
7. To minimize turbidity in the well, use total well depth information obtained from the well construction logs to calculate one casing volume.[1]
8. Attach and secure Teflon or Teflon-lined polyethylene tubing to low-flow (0.10 to 0.50 L/min) stainless steel submersible pump.
9. Lower the submersible pump slowly and gently into the monitoring well to minimize aquifer agitation and mixing of the stagnant well casing water, and then secure the safety drop cable or nylon rope and tubing together with nylon cable-ties.
10. Place the intake of the submersible pump within the upper 12 inches of the water column. The intake of the pump should be placed at an elevation above dense non-aqueous phase liquid (DNAPL), if applicable.
11. Plumb the in-line flow-through cell to the discharge tubing from the well.
12. Plumb a discharge line from the effluent of the flow-through cell to a transportable, purged water storage container.
13. Position a power source (e.g., a generator) for operation of the submersible pump down gradient of the well to be purged.

1 Multiply the total water column thickness (ft) by the cross-sectional area of the well (ft^2) and record in field book and on Well Purging Record form. One cubic foot (ft^3) is equivalent to 7.48 gallons.

7.2 Low Flow Purging and Sampling

Once you have completed the well set up activities above, follow these steps to purge and sample using low-flow techniques:

1. Put on new nitrile gloves. Change nitrile gloves any time the integrity of the glove is compromised during the purging and sampling activities.
2. Activate the low-flow submersible pump and begin extracting groundwater at a rate between 0.10 and 0.50 L/min.

3. Measure the water level approximately every 10 seconds and adjust extraction rate to obtain minimal drawdown in the well of 0.2 feet, but no more than 0.3 feet maximum.
4. Once drawdown is stabilized, begin monitoring water quality indicators (pH, specific conductance, and temperature) using the in-line flow-through cell. Record observations in field book and on the attached Well Purging Record form. *Note: while purging, the pumping rate and groundwater level are measured and recorded every 10 minutes (or as appropriate).*
5. Monitor the water level and extraction rate, in addition to monitoring water quality indicators, and make periodic adjustments to flow rates to ensure steady flow and minimal drawdown.
6. Water quality readings will be monitored every five minutes (or as appropriate) until stabilization criteria are achieved.
7. Stabilization is achieved when a minimum of three (minimum of four if using temperature as an indicator) successive readings for each parameter, collected 3-5 minutes apart, are within the following criteria:

Water Quality Indicator Parameter	Stabilization Criteria
pH	±0.1 s.u.
Specific Conductance	±3%
Temperature	±3% (minimum of ± 0.2°C)
Oxidation-reaction potential (ORP)	± 10 mV
Turbidity	±10%
Dissolved Oxygen	±10%

***Note**: Stabilization criteria is achieved when the average value of three readings are within each parameter criteria limits.*

8. Collect the necessary samples once purging activities are complete and the groundwater stabilization/clarity is acceptable according to applicable protocol described above.
9. If a well is low yield and purged dry, do not collect a sample until it has recharged to approximately 80% of its pre-purge volume, when practical.
10. Collect samples directly from the pump or bailer into the appropriate sample container under typical circumstances. Take care to avoid handling the interior of the bottle or cap. **Do not** place the bottle cap on the ground or in a pocket to avoid contamination.
11. Fill all sampling containers for each well in a manner that minimizes aeration and turbulence. Put on a new pair of nitrile gloves before filling each container.

12. Disconnect or bypass the flow-through cell prior to obtaining each sample. The first volume of groundwater in the tubing is to be discarded and treated according to the waste management section described below. Place the discharge line in position at the base of the sample bottle. Fill the sample bottle from the bottom to the top, allowing it to overflow before sealing. *Note: do not overflow if the sample bottles contain preservatives.*
13. Place samples immediately on ice and store at 4° C.
14. Obtain final water level and flow rate measurements and enter in field book and on the Well Purging Record form.

7.3 Decontamination Procedures

Clean all equipment that will enter the well or come into contact with groundwater prior to each low-flow purging and sampling activity with a stiff brush and a solution of water and laboratory-grade detergent. All decontamination fluids will be disposed of in accordance with the site's waste management plan.

7.4 Documentation

Document all the events, equipment used, and measurements collected during the sampling activities in the field notes. Make all entries in black indelible ink and strike out any corrections with a single line. Initial and date corrections.

Record all manually-measured data and procedural descriptions in a field notebook and on well purging forms (**Attachment 1**). Maintain detailed notes regarding field calibration events, purging or PID anomalies, and volumes of extracted groundwater.

7.5 Waste Management

Transfer all purged water to the hazardous waste accumulation area were it will be pumped through a 20 and 50 micron filter prior to transfer into 6,000-gallon wastewater storage tank. A record of the total gallons will be maintained in the field book.

Porous materials (PPE, rags, etc.) contaminated with groundwater and non-porous materials that cannot be decontaminated will be managed as hazardous waste. Porous and non-porous materials not contaminated with groundwater will be disposed of as residual waste.

RECORDS

1.0 TITLE: FLUID LEVEL GAUGING

2.0 PURPOSE / SCOPE

The purpose of this SOP is to provide general instructions to all GES personnel concerning fluid level gauging activities. The measurement of fluid levels (groundwater or phase-separated compounds) in monitor wells, piezometers, extraction wells, and/or boreholes is required in geotechnical, hydrogeologic, and waste management investigations to determine the presence and condition of the groundwater, or the presence and thickness of phase-separated compounds. Water level measurements (hydraulic head) are used to determine: hydraulic gradients and the direction of groundwater flow; the effectiveness of groundwater extraction systems; and the volume of water required for well purging prior to groundwater sampling. The measurement of the thickness of phase-separated compounds provides a qualitative (not quantitative) monitoring of this form of contamination.

In order to provide reliable data, water levels must be determined over the shortest period of time possible. Barometric pressure can affect groundwater levels and, therefore, observation of significant weather changes during the period of water level measurements must be noted. Tidal fluctuations, navigation controls on rivers, rainfall events and groundwater pumping can also affect groundwater level measurements. Personnel collecting water level data must note if any of these controls are in effect during the groundwater level collection period. Due to possible changes during the groundwater level determination period, it is imperative that the time of data collection at each station be accurately recorded.

In conjunction with groundwater level measurements, surface water (e.g., ponds, lakes, rivers, and lagoons) must be monitored as well. This information is critical in understanding the hydrogeologic setting of the site and, most importantly, how contaminants may move beneath the site.

Note: *The importance of proper and consistent field methods, as well as proper documentation,* ***CANNOT BE OVER-EMPHASIZED***.

This SOP shall be used in conjunction with an approved Health and Safety Plan (HASP). Also, consult the HASP for information on the selection and use of PPE.

3.0 REFERENCE

ASTM 4750 —Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)

ASTM D6000 —Guide for Presentation of Water-Level Information from Ground-Water Sites

U.S. EPA (1986), RCRA Ground water Monitoring Technical Enforcement Guidance Document, Washington, D.C.

U.S. EPA (1992), RCRA Ground water Monitoring: Draft Technical Guidance, Washington, D.C. (EPA/530-R-93-001).

4.0 RESPONSIBILITIES

4.1 Project Manager

The Project Manger (PM) is responsible to ensure that all activities performed by site personnel are performed safely, in compliance with all pertinent regulations and procedures, and provide the necessary equipment and resources to accomplish the tasks described in this procedure.

4.2 Local Health and Safety Officer (LHSO)

The Local Health and Safety Officer (LHSO), in consultation with the Corporate HSO and State project representatives, will designate the appropriate level of personnel protective equipment (PPE) for field personnel to safely accomplish their work.

4.3 Case Manager

The Case Manager (CM) is responsible for providing field personnel with a comprehensive fluid level gauging work plan/schedule. In addition, the PM or CM will provide field personnel with enough information to perform the work safely and correctly. This information should include the operational and safety procedures that are applicable to the work being performed.

4.4 Field Personnel

Field personnel are responsible for the safe completion of assigned tasks as described in the SOPs, Health and Safety Plan (HASP) and appropriate site-specific work plans and procedures. They are required to document the work

performed and to alert their immediate supervisors of any variances from procedures established in the above documents.

5.0 EQUIPMENT / MATERIALS

A number of devices are used by GES to collect water level measurements. Typical devices used are:

- Calibrated electronic water level indicators (e.g., solinst or slope indicator)
- Tape/ploppers
- Pressure transducers and dataloggers (generally for pumping tests and long-term monitoring)
- Stevens recorders for long-term monitoring

Devices typically used by GES to measure phase-separated compounds are:

- Electronic audible interface probe
- Clear bottom-loading bailers
- Weighted cotton string or cord

The pressure transducers, Stevens recorders, and oil/water interface probes have manuals which describe their use. This procedure will focus on an overview of this equipment and other methods which have more widespread use in fluid level measurement.

***Note**: Since many decisions concerning the distribution, transport, and remediation of groundwater contamination will be made on the basis of fluid level monitoring, the accuracy of the measurements made at an appropriate level of precision is very important.*

Typically, the precision required is +/-0.01 foot (+/-1 mm); the majority of GES' measuring devices are graduated to this precision level. To ensure accuracy, double check all fluid level readings; it is very easy to misread a tape or transpose figures when recording the data.

6.0 PREPARATION

Review and perform preparation activities per SOP FM 1.5, *General Instructions for Field Personnel.*

If the water-level data are being collected for the entire site, the Water-Level Measurement Field Sheet, obtained from the PM/CM, should be used (Attachment A). If the data are being collected during low flow ground water sampling, SOP FM 8.5, *Low Flow Groundwater Sampling Procedures* should be followed. If gauging activities are associated with other Site investigation activities the appropriate SOP will be reference accordingly.

Obtain a copy of previous water levels from the PM or CM.

The device used to measure water levels should attain an accuracy of 0.01 ft. A steel tape or an electric sounder can be used to measure water levels, but this SOP only concerns the use of an electric sounder.

When practical, the same portable water-level measurement device should be used for all measurements. However, in order to prevent cross contamination between monitor wells, the water-level indicators must be decontaminated according to SOP FM 14.1, *Decontamination of Dedicated Sampling Equipment*. If an indicator is dedicated to a particular section of the site, or a particular well, it should be marked accordingly.

Obtain and complete the Equipment Checklist (SOP FM 1.5, Attachment A) to confirm that all the necessary materials are available before proceeding.

Make sure water-level measuring equipment is in good operating condition.

Whenever possible, start at those wells that are the least contaminated and work towards more contaminated areas as indicated by the PM or CM.

Clean all equipment per SOP FM 14.1 before the initial and between each use.

7.0 PROCEDURE

Water-Level Measurement Procedure

Once the prior planning and preparation activities are completed, fluid level measurements can proceed. The typical series of events which will take place are:

- Well identification/inspection
- Air monitoring
- Reference point determination
- Level measurements
- Equipment decontamination

- Field note completion, review, and checking
- Equipment return
- Documentation submitted to appropriate staff and files

***Note**: Similar to sampling sequence, fluid level measurements should follow a logical order from the least known or suspected level of contamination to the greatest. This will minimize the potential for cross-contamination between wells/monitoring locations.*

Well Identification/Inspection

Once at the site and prior to fluid level measurements, confirm that the well to be measured has been correctly identified and located. Frequently sites under evaluation have numerous wells, or wells located in clusters such that identification errors can easily occur. The monitoring personnel should be alert to potential cap switching, mislabeled locations or unlabeled wells.

Proper well locations can be determined by comparison of the well log details to measured well details (i.e., total well depth, casing diameter, casing stick-up or stick-down distances), field ties and site plans.

Once the correct monitor well is identified, a thorough inspection shall be completed, and recorded in the field book. Determine if the cap and lock are secure or if they have been tampered with. If the well is unlocked, replace the lock. Any cracks in the protective casing and/or surface seal should be noted, as well as any subsidence or surface water ponding in the vicinity of the well.

Note the results of the well inspection (even if the well is in perfect condition) and inform the Project Coordinator of any well repairs required. Arrange to have any unmarked wells permanently stamped for proper identification. (A temporary marking at the time of monitoring should also be performed.)

Air Monitoring

Unlock and open the protective casing. Remove the well casing cap and monitor the breathing zone directly above the open cap with an organic vapor meter (SOP FM 16.4). Record vapor readings on the Water Level Measurement Field Sheet (Attachment A). Refer to the site-specific HASP if vapor readings are detected above 1.0 parts per million for more than a five minute period. Recording of extended air monitoring activities shall be conducted with the Air Monitoring Record, Real-Time Monitoring sheet (SOP FM 16.4).

Reference Point Determination

Use the top of the reference point as imprinted on the top of the well casing as the measuring reference point. If a reference point is not present, the north side of the well casing will be used as the reference point and marked on the well casing in a manner that can be referred to during future monitoring events (e.g., notch piping or write with permanent marker). This will be the point of measure (POM) to be used when obtaining water-level measurements. Any deviation from this measuring point must be documented on the Water-Level Measurement Field Sheet (Attachment A) and reported to PM or CM.

Level measurements

Measure the distance from the water surface to the POM by placing a steel indicator reference bar (or something comparatively straight and rigid) over the top of the well casing, then lower an electronic water-level indicator or equivalent (i.e., steel tape) into the sounding port as marked. When water is encountered, a light (usually red) will shine on the reel of the water-level indicator, and an intermittent beeping sound will be heard. Slowly move the line up and down along the side of the reference bar until the exact point at which the buzz is heard is located. A continuous beeping sound indicates a phase layer is confirmed. Using the bottom of the reference bar as the measuring point, obtain the depth-to-water measurement and phase layer measurement, if encountered, by referencing the markings on the water-level indicator line to the buzzing tone, red indicator light, or audible beeping sound. Note the reading. Compare the new measurement to previously measured water levels.

***Note**: Beware of watertight caps which provide an airtight seal on the casing end and the water level is positioned within the casing area (i.e., not within the screened interval). Often if this condition exists, a vacuum or pressurized zone is created within the casing section which supports or depresses the water column within the well casing, creating an artificially high or low water column. This effect can cause a few inches or feet of error in the static water level. Two or three water level measurements will confirm water level stability or changing conditions. Once the water level has stabilized (i.e., static) the proper measurement may be taken.*

Equipment decontamination

The water level indicator may then be removed and decontaminated in accordance to the Work Plan requirements.

Field note completion, review, and checking

Record measurement, date, and any notes next to the previous month's water level on the Water-Level Measurement Field Sheet (Attachment A). If the water-

level measurement seems suspect or if there is a 0.5 ft difference from the last reading, then re-check water-level measurement. Place a check mark next to the well ID on the Water-Level Measurement Field Sheet to indicate that the measurement was verified.

Report any measurement anomalies to the PM or CM. Secure well cap and lock the protective casing or cap.

Equipment return

After all equipment has been thoroughly cleaned and decontaminated, return to proper location and complete any necessary equipment forms.

Store water-level indicator in a clean, protected area during transport to the next well and after work is completed.

Documentation submitted to appropriate staff and files

Forward original Water-Level Measurement Field Sheet to PM or CM.

8.0 RECORDS

Field Notes

The field notes must document all the events, equipment used, and measurements collected during the sampling activities. The field notes must be legible and concise so that the entire sample event can be reconstructed later for future reference.

Record field notes in a standard bound survey-type field book issued for general note taking/field records and available from all GES equipment administrators. Make all field book entries black ink and make any changes/corrections with a single strikethrough line. Initial and date to indicate who made the change/ correction and when it was made.

Complete and submit a Water-Level Measurement Field Sheet.

9.0 FOLLOW-UP ACTIVITIES

Perform the following once field activities are complete.

APPENDIX C

Laboratory Reports

ANALYTICAL REPORT

October 16, 2018

GES, Inc. - Concord, CA

Sample Delivery Group:	L1031862
Samples Received:	10/04/2018
Project Number:	3016004-800008-206
Description:	
Site:	1035 GAMBELL ST.
Report To:	Mark Peterson 5046 Commercial Circle, Ste. F Concord, CA 94520

Entire Report Reviewed By:

Jason Romer
Project Manager

TABLE OF CONTENTS

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

MW-9 L1031862-01 GW

Collected by: Amy Zablocki | Collected date/time: 10/01/18 12:40 | Received date/time: 10/04/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/07/18 23:02	10/07/18 23:02	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 09:03	10/10/18 09:03	PP
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1179083	10	10/11/18 01:52	10/11/18 01:52	RAS
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 18:44	SHG
Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM	WG1178312	1	10/10/18 10:31	10/11/18 14:15	CJR

MW-16 L1031862-02 GW

Collected by: Amy Zablocki | Collected date/time: 10/01/18 15:30 | Received date/time: 10/04/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/07/18 23:26	10/07/18 23:26	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 09:24	10/10/18 09:24	PP
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1179083	1	10/11/18 02:12	10/11/18 02:12	RAS
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 19:06	SHG
Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM	WG1178312	1	10/10/18 10:31	10/11/18 14:38	CJR

MW-18 L1031862-03 GW

Collected by: Amy Zablocki | Collected date/time: 10/02/18 15:50 | Received date/time: 10/04/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/07/18 23:51	10/07/18 23:51	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 09:44	10/10/18 09:44	PP
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 19:28	SHG
Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM	WG1178312	1	10/10/18 10:31	10/11/18 15:01	CJR

MW-17 L1031862-04 GW

Collected by: Amy Zablocki | Collected date/time: 10/02/18 17:25 | Received date/time: 10/04/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/08/18 00:15	10/08/18 00:15	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 10:04	10/10/18 10:04	PP
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 19:50	SHG

MW-10 L1031862-05 GW

Collected by: Amy Zablocki | Collected date/time: 10/02/18 14:10 | Received date/time: 10/04/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/08/18 00:40	10/08/18 00:40	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 10:24	10/10/18 10:24	PP
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 20:12	SHG

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	574		10.0	100	1	10/07/2018 23:02	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*95.6*			*50.0-150*		*10/07/2018 23:02*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 09:03	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 09:03	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 09:03	WG1178469
Benzene	U		0.331	1.00	1	10/10/2018 09:03	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 09:03	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 09:03	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 09:03	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 09:03	WG1178469
n-Butylbenzene	6.31		0.361	1.00	1	10/10/2018 09:03	WG1178469
sec-Butylbenzene	5.92		0.365	1.00	1	10/10/2018 09:03	WG1178469
tert-Butylbenzene	0.410	J	0.399	1.00	1	10/10/2018 09:03	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 09:03	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 09:03	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 09:03	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 09:03	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 09:03	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 09:03	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 09:03	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 09:03	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 09:03	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 09:03	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 09:03	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 09:03	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 09:03	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 09:03	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 09:03	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 09:03	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 09:03	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 09:03	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 09:03	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 09:03	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 09:03	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 09:03	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 09:03	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 09:03	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 09:03	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 09:03	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 09:03	WG1178469
Ethylbenzene	8.68		0.384	1.00	1	10/10/2018 09:03	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 09:03	WG1178469
Isopropylbenzene	12.0		0.326	1.00	1	10/10/2018 09:03	WG1178469
p-Isopropyltoluene	11.6		0.350	1.00	1	10/10/2018 09:03	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 09:03	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 09:03	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 09:03	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 09:03	WG1178469
Naphthalene	34.4		1.00	5.00	1	10/10/2018 09:03	WG1178469
n-Propylbenzene	41.5		0.349	1.00	1	10/10/2018 09:03	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 09:03	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 09:03	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 09:03	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 09:03	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 09:03	WG1178469
Toluene	0.843	J	0.412	1.00	1	10/10/2018 09:03	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 09:03	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 09:03	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 09:03	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 09:03	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 09:03	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 09:03	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 09:03	WG1178469
1,2,4-Trimethylbenzene	279		3.73	10.0	10	10/11/2018 01:52	WG1179083
1,2,3-Trimethylbenzene	49.8		0.321	1.00	1	10/10/2018 09:03	WG1178469
1,3,5-Trimethylbenzene	74.6		0.387	1.00	1	10/10/2018 09:03	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 09:03	WG1178469
Xylenes, Total	28.7		1.06	3.00	1	10/10/2018 09:03	WG1178469
(S) Toluene-d8	*106*			*80.0-120*		*10/10/2018 09:03*	WG1178469
(S) Toluene-d8	*103*			*80.0-120*		*10/11/2018 01:52*	WG1179083
(S) Dibromofluoromethane	*108*			*75.0-120*		*10/10/2018 09:03*	WG1178469
(S) Dibromofluoromethane	*92.6*			*75.0-120*		*10/11/2018 01:52*	WG1179083
(S) 4-Bromofluorobenzene	*102*			*77.0-126*		*10/10/2018 09:03*	WG1178469
(S) 4-Bromofluorobenzene	*99.7*			*77.0-126*		*10/11/2018 01:52*	WG1179083

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	2660		170	800	1	10/13/2018 18:44	WG1178967
AK103 RRO C25-C36	484	J	460	800	1	10/13/2018 18:44	WG1178967
(S) o-Terphenyl	*87.0*			*50.0-150*		*10/13/2018 18:44*	WG1178967
(S) n-Triacontane d62	*36.5*	J2		*50.0-150*		*10/13/2018 18:44*	WG1178967

Sample Narrative:

L1031862-01 WG1178967: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	0.0113	J	0.00800	0.0500	1	10/11/2018 14:15	WG1178312
Acenaphthene	0.578		0.0100	0.0500	1	10/11/2018 14:15	WG1178312
Acenaphthylene	0.0840		0.00700	0.0500	1	10/11/2018 14:15	WG1178312
Benzo(a)anthracene	U		0.00830	0.0500	1	10/11/2018 14:15	WG1178312
Benzo(a)pyrene	U		0.0158	0.0500	1	10/11/2018 14:15	WG1178312
Benzo(b)fluoranthene	U		0.00212	0.0500	1	10/11/2018 14:15	WG1178312
Benzo(g,h,i)perylene	U		0.00227	0.0500	1	10/11/2018 14:15	WG1178312
Benzo(k)fluoranthene	U		0.0255	0.0500	1	10/11/2018 14:15	WG1178312
Chrysene	U		0.0144	0.0500	1	10/11/2018 14:15	WG1178312
Dibenz(a,h)anthracene	U		0.00454	0.0500	1	10/11/2018 14:15	WG1178312
Fluoranthene	U		0.0165	0.0500	1	10/11/2018 14:15	WG1178312
Fluorene	0.420		0.00898	0.0500	1	10/11/2018 14:15	WG1178312
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500	1	10/11/2018 14:15	WG1178312
Naphthalene	19.3		0.0123	0.250	1	10/11/2018 14:15	WG1178312
Phenanthrene	0.0238	J	0.0184	0.0500	1	10/11/2018 14:15	WG1178312
Pyrene	U		0.0155	0.0500	1	10/11/2018 14:15	WG1178312
1-Methylnaphthalene	20.6		0.0189	0.250	1	10/11/2018 14:15	WG1178312

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	14.3		0.0155	0.250	1	10/11/2018 14:15	WG1178312
2-Chloronaphthalene	0.0442	J	0.0165	0.250	1	10/11/2018 14:15	WG1178312
(S) Nitrobenzene-d5	*56.2*			*11.0-135*		*10/11/2018 14:15*	WG1178312
(S) 2-Fluorobiphenyl	*86.5*			*32.0-120*		*10/11/2018 14:15*	WG1178312
(S) p-Terphenyl-d14	*118*			*23.0-122*		*10/11/2018 14:15*	WG1178312

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	203		10.0	100	1	10/07/2018 23:26	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*88.0*			*50.0-150*		*10/07/2018 23:26*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 09:24	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 09:24	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 09:24	WG1178469
Benzene	3.26		0.331	1.00	1	10/10/2018 09:24	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 09:24	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 09:24	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 09:24	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 09:24	WG1178469
n-Butylbenzene	1.19		0.361	1.00	1	10/10/2018 09:24	WG1178469
sec-Butylbenzene	1.70		0.365	1.00	1	10/10/2018 09:24	WG1178469
tert-Butylbenzene	U		0.399	1.00	1	10/10/2018 09:24	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 09:24	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 09:24	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 09:24	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 09:24	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 09:24	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 09:24	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 09:24	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 09:24	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 09:24	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 09:24	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 09:24	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 09:24	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 09:24	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 09:24	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 09:24	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 09:24	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 09:24	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 09:24	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 09:24	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 09:24	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 09:24	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 09:24	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 09:24	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 09:24	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 09:24	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 09:24	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 09:24	WG1178469
Ethylbenzene	10.1		0.384	1.00	1	10/10/2018 09:24	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 09:24	WG1178469
Isopropylbenzene	4.68		0.326	1.00	1	10/10/2018 09:24	WG1178469
p-Isopropyltoluene	2.96		0.350	1.00	1	10/10/2018 09:24	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 09:24	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 09:24	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 09:24	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 09:24	WG1178469
Naphthalene	8.96		1.00	5.00	1	10/10/2018 09:24	WG1178469
n-Propylbenzene	8.96		0.349	1.00	1	10/10/2018 09:24	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 09:24	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 09:24	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 09:24	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 09:24	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 09:24	WG1178469
Toluene	1.03		0.412	1.00	1	10/10/2018 09:24	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 09:24	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 09:24	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 09:24	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 09:24	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 09:24	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 09:24	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 09:24	WG1178469
1,2,4-Trimethylbenzene	44.9		0.373	1.00	1	10/11/2018 02:12	WG1179083
1,2,3-Trimethylbenzene	16.1		0.321	1.00	1	10/10/2018 09:24	WG1178469
1,3,5-Trimethylbenzene	8.67		0.387	1.00	1	10/10/2018 09:24	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 09:24	WG1178469
Xylenes, Total	20.8		1.06	3.00	1	10/10/2018 09:24	WG1178469
(S) Toluene-d8	*107*			*80.0-120*		*10/10/2018 09:24*	WG1178469
(S) Toluene-d8	*102*			*80.0-120*		*10/11/2018 02:12*	WG1179083
(S) Dibromofluoromethane	*111*			*75.0-120*		*10/10/2018 09:24*	WG1178469
(S) Dibromofluoromethane	*91.7*			*75.0-120*		*10/11/2018 02:12*	WG1179083
(S) 4-Bromofluorobenzene	*94.1*			*77.0-126*		*10/10/2018 09:24*	WG1178469
(S) 4-Bromofluorobenzene	*101*			*77.0-126*		*10/11/2018 02:12*	WG1179083

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	4460		170	800	1	10/13/2018 19:06	WG1178967
AK103 RRO C25-C36	1280		460	800	1	10/13/2018 19:06	WG1178967
(S) o-Terphenyl	*89.0*			*50.0-150*		*10/13/2018 19:06*	WG1178967
(S) n-Triacontane d62	*39.8*	J2		*50.0-150*		*10/13/2018 19:06*	WG1178967

Sample Narrative:

L1031862-02 WG1178967: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	0.0668		0.00800	0.0500	1	10/11/2018 14:38	WG1178312
Acenaphthene	0.425		0.0100	0.0500	1	10/11/2018 14:38	WG1178312
Acenaphthylene	U		0.00700	0.0500	1	10/11/2018 14:38	WG1178312
Benzo(a)anthracene	U		0.00830	0.0500	1	10/11/2018 14:38	WG1178312
Benzo(a)pyrene	U		0.0158	0.0500	1	10/11/2018 14:38	WG1178312
Benzo(b)fluoranthene	U		0.00212	0.0500	1	10/11/2018 14:38	WG1178312
Benzo(g,h,i)perylene	U		0.00227	0.0500	1	10/11/2018 14:38	WG1178312
Benzo(k)fluoranthene	U		0.0255	0.0500	1	10/11/2018 14:38	WG1178312
Chrysene	U		0.0144	0.0500	1	10/11/2018 14:38	WG1178312
Dibenz(a,h)anthracene	U		0.00454	0.0500	1	10/11/2018 14:38	WG1178312
Fluoranthene	U		0.0165	0.0500	1	10/11/2018 14:38	WG1178312
Fluorene	0.536		0.00898	0.0500	1	10/11/2018 14:38	WG1178312
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500	1	10/11/2018 14:38	WG1178312
Naphthalene	2.85		0.0123	0.250	1	10/11/2018 14:38	WG1178312
Phenanthrene	0.211		0.0184	0.0500	1	10/11/2018 14:38	WG1178312
Pyrene	U		0.0155	0.0500	1	10/11/2018 14:38	WG1178312
1-Methylnaphthalene	3.27		0.0189	0.250	1	10/11/2018 14:38	WG1178312

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
2-Methylnaphthalene	0.785		0.0155	0.250	1	10/11/2018 14:38	WG1178312
2-Chloronaphthalene	U		0.0165	0.250	1	10/11/2018 14:38	WG1178312
(S) Nitrobenzene-d5	*55.5*			*11.0-135*		*10/11/2018 14:38*	WG1178312
(S) 2-Fluorobiphenyl	*92.9*			*32.0-120*		*10/11/2018 14:38*	WG1178312
(S) p-Terphenyl-d14	*119*			*23.0-122*		*10/11/2018 14:38*	WG1178312

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	12.5	J	10.0	100	1	10/07/2018 23:51	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*82.6*			*50.0-150*		*10/07/2018 23:51*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 09:44	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 09:44	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 09:44	WG1178469
Benzene	U		0.331	1.00	1	10/10/2018 09:44	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 09:44	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 09:44	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 09:44	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 09:44	WG1178469
n-Butylbenzene	U		0.361	1.00	1	10/10/2018 09:44	WG1178469
sec-Butylbenzene	U		0.365	1.00	1	10/10/2018 09:44	WG1178469
tert-Butylbenzene	U		0.399	1.00	1	10/10/2018 09:44	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 09:44	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 09:44	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 09:44	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 09:44	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 09:44	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 09:44	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 09:44	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 09:44	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 09:44	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 09:44	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 09:44	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 09:44	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 09:44	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 09:44	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 09:44	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 09:44	WG1178469
1,2-Dichloroethane	0.639	J	0.361	1.00	1	10/10/2018 09:44	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 09:44	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 09:44	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 09:44	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 09:44	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 09:44	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 09:44	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 09:44	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 09:44	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 09:44	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 09:44	WG1178469
Ethylbenzene	U		0.384	1.00	1	10/10/2018 09:44	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 09:44	WG1178469
Isopropylbenzene	U		0.326	1.00	1	10/10/2018 09:44	WG1178469
p-Isopropyltoluene	U		0.350	1.00	1	10/10/2018 09:44	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 09:44	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 09:44	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 09:44	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 09:44	WG1178469
Naphthalene	U		1.00	5.00	1	10/10/2018 09:44	WG1178469
n-Propylbenzene	U		0.349	1.00	1	10/10/2018 09:44	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 09:44	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 09:44	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 09:44	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 09:44	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 09:44	WG1178469
Toluene	U		0.412	1.00	1	10/10/2018 09:44	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 09:44	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 09:44	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 09:44	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 09:44	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 09:44	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 09:44	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 09:44	WG1178469
1,2,4-Trimethylbenzene	U		0.373	1.00	1	10/10/2018 09:44	WG1178469
1,2,3-Trimethylbenzene	U		0.321	1.00	1	10/10/2018 09:44	WG1178469
1,3,5-Trimethylbenzene	U		0.387	1.00	1	10/10/2018 09:44	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 09:44	WG1178469
Xylenes, Total	U		1.06	3.00	1	10/10/2018 09:44	WG1178469
(S) Toluene-d8	*110*			*80.0-120*		*10/10/2018 09:44*	WG1178469
(S) Dibromofluoromethane	*105*			*75.0-120*		*10/10/2018 09:44*	WG1178469
(S) 4-Bromofluorobenzene	*97.7*			*77.0-126*		*10/10/2018 09:44*	WG1178469

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	875		170	800	1	10/13/2018 19:28	WG1178967
AK103 RRO C25-C36	547	J	460	800	1	10/13/2018 19:28	WG1178967
(S) o-Terphenyl	*68.8*			*50.0-150*		*10/13/2018 19:28*	WG1178967
(S) n-Triacontane d62	*24.8*	J2		*50.0-150*		*10/13/2018 19:28*	WG1178967

Sample Narrative:

L1031862-03 WG1178967: Sample produced heavy emulsion during Extraction process, low surr/spike recoveries due to matrix

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	U		0.00800	0.0500	1	10/11/2018 15:01	WG1178312
Acenaphthene	U		0.0100	0.0500	1	10/11/2018 15:01	WG1178312
Acenaphthylene	U		0.00700	0.0500	1	10/11/2018 15:01	WG1178312
Benzo(a)anthracene	U		0.00830	0.0500	1	10/11/2018 15:01	WG1178312
Benzo(a)pyrene	U		0.0158	0.0500	1	10/11/2018 15:01	WG1178312
Benzo(b)fluoranthene	U		0.00212	0.0500	1	10/11/2018 15:01	WG1178312
Benzo(g,h,i)perylene	U		0.00227	0.0500	1	10/11/2018 15:01	WG1178312
Benzo(k)fluoranthene	U		0.0255	0.0500	1	10/11/2018 15:01	WG1178312
Chrysene	U		0.0144	0.0500	1	10/11/2018 15:01	WG1178312
Dibenz(a,h)anthracene	U		0.00454	0.0500	1	10/11/2018 15:01	WG1178312
Fluoranthene	U		0.0165	0.0500	1	10/11/2018 15:01	WG1178312
Fluorene	U		0.00898	0.0500	1	10/11/2018 15:01	WG1178312
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500	1	10/11/2018 15:01	WG1178312
Naphthalene	0.0482	J	0.0123	0.250	1	10/11/2018 15:01	WG1178312
Phenanthrene	U		0.0184	0.0500	1	10/11/2018 15:01	WG1178312
Pyrene	U		0.0155	0.0500	1	10/11/2018 15:01	WG1178312
1-Methylnaphthalene	U		0.0189	0.250	1	10/11/2018 15:01	WG1178312
2-Methylnaphthalene	U		0.0155	0.250	1	10/11/2018 15:01	WG1178312
2-Chloronaphthalene	U		0.0165	0.250	1	10/11/2018 15:01	WG1178312
(S) Nitrobenzene-d5	*52.2*			*11.0-135*		*10/11/2018 15:01*	WG1178312

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
(S) 2-Fluorobiphenyl	*82.6*			*32.0-120*		*10/11/2018 15:01*	WG1178312
(S) p-Terphenyl-d14	*121*			*23.0-122*		*10/11/2018 15:01*	WG1178312

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	U		10.0	100	1	10/08/2018 00:15	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*82.8*			*50.0-150*		*10/08/2018 00:15*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 10:04	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 10:04	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 10:04	WG1178469
Benzene	U		0.331	1.00	1	10/10/2018 10:04	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 10:04	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 10:04	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 10:04	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 10:04	WG1178469
n-Butylbenzene	U		0.361	1.00	1	10/10/2018 10:04	WG1178469
sec-Butylbenzene	U		0.365	1.00	1	10/10/2018 10:04	WG1178469
tert-Butylbenzene	U		0.399	1.00	1	10/10/2018 10:04	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 10:04	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 10:04	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 10:04	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 10:04	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 10:04	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 10:04	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 10:04	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 10:04	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 10:04	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 10:04	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 10:04	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 10:04	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 10:04	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 10:04	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 10:04	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 10:04	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 10:04	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 10:04	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 10:04	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 10:04	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 10:04	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 10:04	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 10:04	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 10:04	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 10:04	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 10:04	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 10:04	WG1178469
Ethylbenzene	U		0.384	1.00	1	10/10/2018 10:04	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 10:04	WG1178469
Isopropylbenzene	U		0.326	1.00	1	10/10/2018 10:04	WG1178469
p-Isopropyltoluene	U		0.350	1.00	1	10/10/2018 10:04	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 10:04	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 10:04	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 10:04	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 10:04	WG1178469
Naphthalene	U		1.00	5.00	1	10/10/2018 10:04	WG1178469
n-Propylbenzene	U		0.349	1.00	1	10/10/2018 10:04	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 10:04	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 10:04	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 10:04	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 10:04	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 10:04	WG1178469
Toluene	U		0.412	1.00	1	10/10/2018 10:04	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 10:04	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 10:04	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 10:04	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 10:04	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 10:04	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 10:04	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 10:04	WG1178469
1,2,4-Trimethylbenzene	U		0.373	1.00	1	10/10/2018 10:04	WG1178469
1,2,3-Trimethylbenzene	U		0.321	1.00	1	10/10/2018 10:04	WG1178469
1,3,5-Trimethylbenzene	U		0.387	1.00	1	10/10/2018 10:04	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 10:04	WG1178469
Xylenes, Total	U		1.06	3.00	1	10/10/2018 10:04	WG1178469
(S) Toluene-d8	*102*			*80.0-120*		*10/10/2018 10:04*	WG1178469
(S) Dibromofluoromethane	*107*			*75.0-120*		*10/10/2018 10:04*	WG1178469
(S) 4-Bromofluorobenzene	*92.7*			*77.0-126*		*10/10/2018 10:04*	WG1178469

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	290	J	170	800	1	10/13/2018 19:50	WG1178967
AK103 RRO C25-C36	569	J	460	800	1	10/13/2018 19:50	WG1178967
(S) o-Terphenyl	*82.0*			*50.0-150*		*10/13/2018 19:50*	WG1178967
(S) n-Triacontane d62	*39.4*	J2		*50.0-150*		*10/13/2018 19:50*	WG1178967

Sample Narrative:

L1031862-04 WG1178967: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	U		10.0	100	1	10/08/2018 00:40	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*83.7*			*50.0-150*		*10/08/2018 00:40*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 10:24	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 10:24	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 10:24	WG1178469
Benzene	U		0.331	1.00	1	10/10/2018 10:24	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 10:24	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 10:24	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 10:24	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 10:24	WG1178469
n-Butylbenzene	U		0.361	1.00	1	10/10/2018 10:24	WG1178469
sec-Butylbenzene	U		0.365	1.00	1	10/10/2018 10:24	WG1178469
tert-Butylbenzene	U		0.399	1.00	1	10/10/2018 10:24	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 10:24	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 10:24	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 10:24	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 10:24	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 10:24	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 10:24	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 10:24	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 10:24	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 10:24	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 10:24	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 10:24	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 10:24	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 10:24	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 10:24	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 10:24	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 10:24	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 10:24	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 10:24	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 10:24	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 10:24	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 10:24	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 10:24	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 10:24	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 10:24	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 10:24	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 10:24	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 10:24	WG1178469
Ethylbenzene	U		0.384	1.00	1	10/10/2018 10:24	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 10:24	WG1178469
Isopropylbenzene	U		0.326	1.00	1	10/10/2018 10:24	WG1178469
p-Isopropyltoluene	U		0.350	1.00	1	10/10/2018 10:24	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 10:24	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 10:24	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 10:24	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 10:24	WG1178469
Naphthalene	U		1.00	5.00	1	10/10/2018 10:24	WG1178469
n-Propylbenzene	U		0.349	1.00	1	10/10/2018 10:24	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 10:24	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 10:24	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 10:24	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 10:24	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 10:24	WG1178469
Toluene	U		0.412	1.00	1	10/10/2018 10:24	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 10:24	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 10:24	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 10:24	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 10:24	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 10:24	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 10:24	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 10:24	WG1178469
1,2,4-Trimethylbenzene	U		0.373	1.00	1	10/10/2018 10:24	WG1178469
1,2,3-Trimethylbenzene	U		0.321	1.00	1	10/10/2018 10:24	WG1178469
1,3,5-Trimethylbenzene	U		0.387	1.00	1	10/10/2018 10:24	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 10:24	WG1178469
Xylenes, Total	U		1.06	3.00	1	10/10/2018 10:24	WG1178469
(S) Toluene-d8	*101*			*80.0-120*		*10/10/2018 10:24*	WG1178469
(S) Dibromofluoromethane	*104*			*75.0-120*		*10/10/2018 10:24*	WG1178469
(S) 4-Bromofluorobenzene	*94.4*			*77.0-126*		*10/10/2018 10:24*	WG1178469

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	U		170	800	1	10/13/2018 20:12	WG1178967
AK103 RRO C25-C36	U		460	800	1	10/13/2018 20:12	WG1178967
(S) o-Terphenyl	*72.0*			*50.0-150*		*10/13/2018 20:12*	WG1178967
(S) n-Triacontane d62	*27.8*	J2		*50.0-150*		*10/13/2018 20:12*	WG1178967

Sample Narrative:

L1031862-05 WG1178967: Sample produced heavy emulsion during Extraction process, low surr/spike recoveries due to matrix

Method Blank (MB)

(MB) R3348920-2 10/07/18 20:15

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
TPHGAK C6 to C10	U		10.0	100
(S) a,a,a-Trifluorotoluene(FID)	*84.2*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3348920-1 10/07/18 19:27 • (LCSD) R3348920-3 10/08/18 07:00

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPHGAK C6 to C10	400	377	366	94.2	91.4	60.0-120			3.05	20
(S) a,a,a-Trifluorotoluene(FID)				*86.5*	*85.2*	*50.0-150*				

Method Blank (MB)

(MB) R3349471-3 10/10/18 06:24

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		10.0	50.0
Acrolein	U		8.87	50.0
Acrylonitrile	U		1.87	10.0
Benzene	U		0.331	1.00
Bromobenzene	U		0.352	1.00
Bromodichloromethane	U		0.380	1.00
Bromoform	U		0.469	1.00
Bromomethane	U		0.866	5.00
n-Butylbenzene	U		0.361	1.00
sec-Butylbenzene	U		0.365	1.00
tert-Butylbenzene	U		0.399	1.00
Carbon tetrachloride	U		0.379	1.00
Chlorobenzene	U		0.348	1.00
Chlorodibromomethane	U		0.327	1.00
Chloroethane	U		0.453	5.00
Chloroform	U		0.324	5.00
Chloromethane	U		0.276	2.50
2-Chlorotoluene	U		0.375	1.00
4-Chlorotoluene	U		0.351	1.00
1,2-Dibromo-3-Chloropropane	U		1.33	5.00
1,2-Dibromoethane	U		0.381	1.00
Dibromomethane	U		0.346	1.00
1,2-Dichlorobenzene	U		0.349	1.00
1,3-Dichlorobenzene	U		0.220	1.00
1,4-Dichlorobenzene	U		0.274	1.00
Dichlorodifluoromethane	U		0.551	5.00
1,1-Dichloroethane	U		0.259	1.00
1,2-Dichloroethane	U		0.361	1.00
1,1-Dichloroethene	U		0.398	1.00
cis-1,2-Dichloroethene	U		0.260	1.00
trans-1,2-Dichloroethene	U		0.396	1.00
1,2-Dichloropropane	U		0.306	1.00
1,1-Dichloropropene	U		0.352	1.00
1,3-Dichloropropane	U		0.366	1.00
cis-1,3-Dichloropropene	U		0.418	1.00
trans-1,3-Dichloropropene	U		0.419	1.00
2,2-Dichloropropane	U		0.321	1.00
Di-isopropyl ether	U		0.320	1.00
Ethylbenzene	U		0.384	1.00
Hexachloro-1,3-butadiene	0.401	J	0.256	1.00

Method Blank (MB)

(MB) R3349471-3 10/10/18 06:24

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Isopropylbenzene	U		0.326	1.00
p-Isopropyltoluene	U		0.350	1.00
2-Butanone (MEK)	U		3.93	10.0
Methylene Chloride	U		1.00	5.00
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0
Methyl tert-butyl ether	U		0.367	1.00
Naphthalene	U		1.00	5.00
n-Propylbenzene	U		0.349	1.00
Styrene	U		0.307	1.00
1,1,1,2-Tetrachloroethane	U		0.385	1.00
1,1,2,2-Tetrachloroethane	U		0.130	1.00
Tetrachloroethene	U		0.372	1.00
Toluene	U		0.412	1.00
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00
1,2,3-Trichlorobenzene	0.304	J	0.230	1.00
1,2,4-Trichlorobenzene	U		0.355	1.00
1,1,1-Trichloroethane	U		0.319	1.00
1,1,2-Trichloroethane	U		0.383	1.00
Trichloroethene	U		0.398	1.00
Trichlorofluoromethane	U		1.20	5.00
1,2,3-Trichloropropane	U		0.807	2.50
1,2,3-Trimethylbenzene	U		0.321	1.00
1,2,4-Trimethylbenzene	U		0.373	1.00
1,3,5-Trimethylbenzene	U		0.387	1.00
Vinyl chloride	U		0.259	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*101*			*80.0-120*
(S) Dibromofluoromethane	*108*			*75.0-120*
(S) 4-Bromofluorobenzene	*107*			*77.0-126*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349471-1 10/10/18 05:24 • (LCSD) R3349471-2 10/10/18 05:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	125	178	148	142	118	19.0-160			18.1	27
Acrolein	125	124	101	99.3	80.9	10.0-160			20.4	26
Acrylonitrile	125	143	136	114	109	55.0-149			5.28	20
Benzene	25.0	23.8	22.6	95.2	90.4	70.0-123			5.19	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349471-1 10/10/18 05:24 • (LCSD) R3349471-2 10/10/18 05:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromobenzene	25.0	23.0	21.5	92.0	86.1	73.0-121			6.65	20
Bromodichloromethane	25.0	23.9	23.7	95.7	94.9	75.0-120			0.833	20
Bromoform	25.0	22.7	22.3	90.8	89.4	68.0-132			1.62	20
Bromomethane	25.0	20.1	19.9	80.4	79.5	10.0-160			1.19	25
n-Butylbenzene	25.0	22.7	20.8	90.8	83.4	73.0-125			8.56	20
sec-Butylbenzene	25.0	24.6	23.8	98.3	95.0	75.0-125			3.35	20
tert-Butylbenzene	25.0	26.2	24.4	105	97.6	76.0-124			7.22	20
Carbon tetrachloride	25.0	23.0	22.9	92.1	91.6	68.0-126			0.598	20
Chlorobenzene	25.0	28.8	26.9	115	108	80.0-121			6.58	20
Chlorodibromomethane	25.0	28.8	26.9	115	108	77.0-125			6.85	20
Chloroethane	25.0	21.3	21.0	85.0	83.9	47.0-150			1.40	20
Chloroform	25.0	24.8	23.3	99.3	93.2	73.0-120			6.26	20
Chloromethane	25.0	22.9	19.7	91.7	78.8	41.0-142			15.1	20
2-Chlorotoluene	25.0	24.8	23.1	99.2	92.3	76.0-123			7.18	20
4-Chlorotoluene	25.0	24.5	24.4	97.9	97.8	75.0-122			0.154	20
1,2-Dibromo-3-Chloropropane	25.0	25.1	23.8	100	95.1	58.0-134			5.25	20
1,2-Dibromoethane	25.0	29.1	26.1	116	104	80.0-122			11.0	20
Dibromomethane	25.0	24.1	22.7	96.4	90.7	80.0-120			6.17	20
1,2-Dichlorobenzene	25.0	25.0	24.7	100	98.7	79.0-121			1.31	20
1,3-Dichlorobenzene	25.0	26.3	25.1	105	100	79.0-120			4.93	20
1,4-Dichlorobenzene	25.0	24.5	24.7	98.1	98.8	79.0-120			0.681	20
Dichlorodifluoromethane	25.0	25.5	23.7	102	94.9	51.0-149			7.09	20
1,1-Dichloroethane	25.0	23.2	22.2	92.9	88.9	70.0-126			4.41	20
1,2-Dichloroethane	25.0	25.1	24.5	100	98.0	70.0-128			2.27	20
1,1-Dichloroethene	25.0	25.6	24.5	102	98.0	71.0-124			4.39	20
cis-1,2-Dichloroethene	25.0	25.1	23.7	100	94.6	73.0-120			5.85	20
trans-1,2-Dichloroethene	25.0	24.8	22.3	99.3	89.3	73.0-120			10.6	20
1,2-Dichloropropane	25.0	24.9	24.6	99.7	98.5	77.0-125			1.28	20
1,1-Dichloropropene	25.0	23.2	23.0	92.6	92.2	74.0-126			0.448	20
1,3-Dichloropropane	25.0	26.2	23.5	105	93.8	80.0-120			11.2	20
cis-1,3-Dichloropropene	25.0	24.2	23.8	96.6	95.3	80.0-123			1.40	20
trans-1,3-Dichloropropene	25.0	26.2	24.2	105	96.8	78.0-124			8.04	20
2,2-Dichloropropane	25.0	22.8	22.0	91.4	88.1	58.0-130			3.64	20
Di-isopropyl ether	25.0	29.3	26.2	117	105	58.0-138			11.1	20
Ethylbenzene	25.0	29.4	27.4	118	110	79.0-123			7.02	20
Hexachloro-1,3-butadiene	25.0	19.3	21.2	77.0	84.9	54.0-138			9.66	20
Isopropylbenzene	25.0	24.7	24.0	98.7	96.1	76.0-127			2.68	20
p-Isopropyltoluene	25.0	24.8	23.5	99.3	94.0	76.0-125			5.49	20
2-Butanone (MEK)	125	158	147	126	118	44.0-160			6.95	20
Methylene Chloride	25.0	23.0	20.5	91.9	81.8	67.0-120			11.6	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349471-1 10/10/18 05:24 • (LCSD) R3349471-2 10/10/18 05:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	125	167	153	134	122	68.0-142			9.00	20
Methyl tert-butyl ether	25.0	23.7	22.5	94.9	89.9	68.0-125			5.46	20
Naphthalene	25.0	23.0	22.8	91.8	91.0	54.0-135			0.851	20
n-Propylbenzene	25.0	25.2	24.1	101	96.3	77.0-124			4.64	20
Styrene	25.0	25.4	23.6	102	94.2	73.0-130			7.53	20
1,1,1,2-Tetrachloroethane	25.0	28.9	27.7	115	111	75.0-125			3.95	20
1,1,2,2-Tetrachloroethane	25.0	23.5	21.4	94.0	85.4	65.0-130			9.53	20
Tetrachloroethene	25.0	28.1	26.4	112	106	72.0-132			6.14	20
Toluene	25.0	27.8	25.0	111	100	79.0-120			10.7	20
1,1,2-Trichlorotrifluoroethane	25.0	24.7	23.8	98.8	95.2	69.0-132			3.72	20
1,2,3-Trichlorobenzene	25.0	19.8	21.2	79.2	85.0	50.0-138			7.07	20
1,2,4-Trichlorobenzene	25.0	22.6	22.7	90.4	90.7	57.0-137			0.332	20
1,1,1-Trichloroethane	25.0	25.7	24.5	103	98.0	73.0-124			4.85	20
1,1,2-Trichloroethane	25.0	27.5	25.8	110	103	80.0-120			6.36	20
Trichloroethene	25.0	26.3	25.7	105	103	78.0-124			2.18	20
Trichlorofluoromethane	25.0	24.4	24.2	97.6	97.0	59.0-147			0.652	20
1,2,3-Trichloropropane	25.0	24.7	24.8	98.9	99.3	73.0-130			0.372	20
1,2,3-Trimethylbenzene	25.0	24.7	24.1	98.9	96.5	77.0-120			2.46	20
1,2,4-Trimethylbenzene	25.0	25.4	24.3	101	97.4	76.0-121			4.08	20
1,3,5-Trimethylbenzene	25.0	24.5	24.1	98.0	96.5	76.0-122			1.62	20
Vinyl chloride	25.0	22.4	21.9	89.4	87.6	67.0-131			2.08	20
Xylenes, Total	75.0	88.0	79.9	117	107	79.0-123			9.65	20
(S) Toluene-d8				*114*	*108*	*80.0-120*				
(S) Dibromofluoromethane				*100*	*103*	*75.0-120*				
(S) 4-Bromofluorobenzene				*94.4*	*102*	*77.0-126*				

Method Blank (MB)

(MB) R3349721-3 10/10/18 22:57

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
1,2,4-Trimethylbenzene	U		0.373	1.00
(S) Toluene-d8	*102*			*80.0-120*
(S) Dibromofluoromethane	*95.3*			*75.0-120*
(S) 4-Bromofluorobenzene	*99.2*			*77.0-126*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349721-1 10/10/18 21:39 • (LCSD) R3349721-2 10/10/18 21:58

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,2,4-Trimethylbenzene	25.0	23.4	23.9	93.6	95.7	76.0-121			2.28	20
(S) Toluene-d8				*104*	*107*	*80.0-120*				
(S) Dibromofluoromethane				*91.6*	*94.5*	*75.0-120*				
(S) 4-Bromofluorobenzene				*96.6*	*98.7*	*77.0-126*				

Method Blank (MB)

(MB) R3350439-1 10/13/18 16:53

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
AK102 DRO C10-C25	U		170	800
AK103 RRO C25-C36	U		460	800
(S) n-Triacontane d62	*95.6*			*50.0-150*
(S) o-Terphenyl	*73.0*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3350439-2 10/13/18 17:15 • (LCSD) R3350439-3 10/13/18 17:37

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	3000	2760	3090	92.0	103	75.0-125			11.3	20
(S) n-Triacontane d62				*64.3*	*65.6*	*50.0-150*				
(S) o-Terphenyl				*97.5*	*99.0*	*50.0-150*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3350439-4 10/13/18 17:59 • (LCSD) R3350439-5 10/13/18 18:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK103 RRO C25-C36	3000	2910	3020	97.0	101	60.0-120			3.71	20
(S) n-Triacontane d62				*190*	*188*	*50.0-150*	J1	J1		
(S) o-Terphenyl				*78.3*	*82.2*	*50.0-150*				

Method Blank (MB)

(MB) R3349649-1 10/11/18 09:26

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Anthracene	U		0.00800	0.0500
Acenaphthene	U		0.0100	0.0500
Acenaphthylene	U		0.00700	0.0500
Benzo(a)anthracene	U		0.00830	0.0500
Benzo(a)pyrene	U		0.0158	0.0500
Benzo(b)fluoranthene	U		0.00212	0.0500
Benzo(g,h,i)perylene	0.00238	J	0.00227	0.0500
Benzo(k)fluoranthene	U		0.0255	0.0500
Chrysene	U		0.0144	0.0500
Dibenz(a,h)anthracene	U		0.00454	0.0500
Fluoranthene	U		0.0165	0.0500
Fluorene	U		0.00898	0.0500
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500
Naphthalene	U		0.0123	0.250
Phenanthrene	U		0.0184	0.0500
Pyrene	U		0.0155	0.0500
1-Methylnaphthalene	U		0.0189	0.250
2-Methylnaphthalene	U		0.0155	0.250
2-Chloronaphthalene	U		0.0165	0.250
(S) Nitrobenzene-d5	*61.5*			*11.0-135*
(S) 2-Fluorobiphenyl	*103*			*32.0-120*
(S) p-Terphenyl-d14	*112*			*23.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349649-2 10/11/18 09:49 • (LCSD) R3349649-3 10/11/18 10:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	2.00	1.98	2.18	99.0	109	43.0-127			9.62	20
Acenaphthene	2.00	2.06	2.23	103	111	42.0-120			7.93	20
Acenaphthylene	2.00	1.86	2.07	93.0	103	43.0-120			10.7	20
Benzo(a)anthracene	2.00	2.08	2.23	104	111	46.0-120			6.96	20
Benzo(a)pyrene	2.00	2.02	2.21	101	111	44.0-122			8.98	20
Benzo(b)fluoranthene	2.00	2.12	2.33	106	117	43.0-122			9.44	20
Benzo(g,h,i)perylene	2.00	2.23	2.43	111	122	25.0-137			8.58	23
Benzo(k)fluoranthene	2.00	2.27	2.31	114	115	39.0-128			1.75	22
Chrysene	2.00	2.24	2.35	112	117	42.0-129			4.79	20
Dibenz(a,h)anthracene	2.00	2.20	2.46	110	123	25.0-139			11.2	22
Fluoranthene	2.00	2.41	2.56	120	128	48.0-131			6.04	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349649-2 10/11/18 09:49 • (LCSD) R3349649-3 10/11/18 10:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	2.00	1.89	2.01	94.5	100	42.0-120			6.15	20
Indeno(1,2,3-cd)pyrene	2.00	2.30	2.51	115	125	37.0-133			8.73	20
Naphthalene	2.00	1.50	1.71	75.0	85.5	30.0-120			13.1	22
Phenanthrene	2.00	1.97	2.10	98.5	105	42.0-120			6.39	20
Pyrene	2.00	2.06	2.17	103	108	38.0-124			5.20	20
1-Methylnaphthalene	2.00	1.81	1.98	90.5	99.0	43.0-120			8.97	20
2-Methylnaphthalene	2.00	1.70	1.89	85.0	94.5	40.0-120			10.6	20
2-Chloronaphthalene	2.00	1.91	2.07	95.5	103	39.0-120			8.04	20
(S) Nitrobenzene-d5				*58.5*	*66.0*	*11.0-135*				
(S) 2-Fluorobiphenyl				*103*	*111*	*32.0-120*				
(S) p-Terphenyl-d14				*114*	*119*	*23.0-122*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

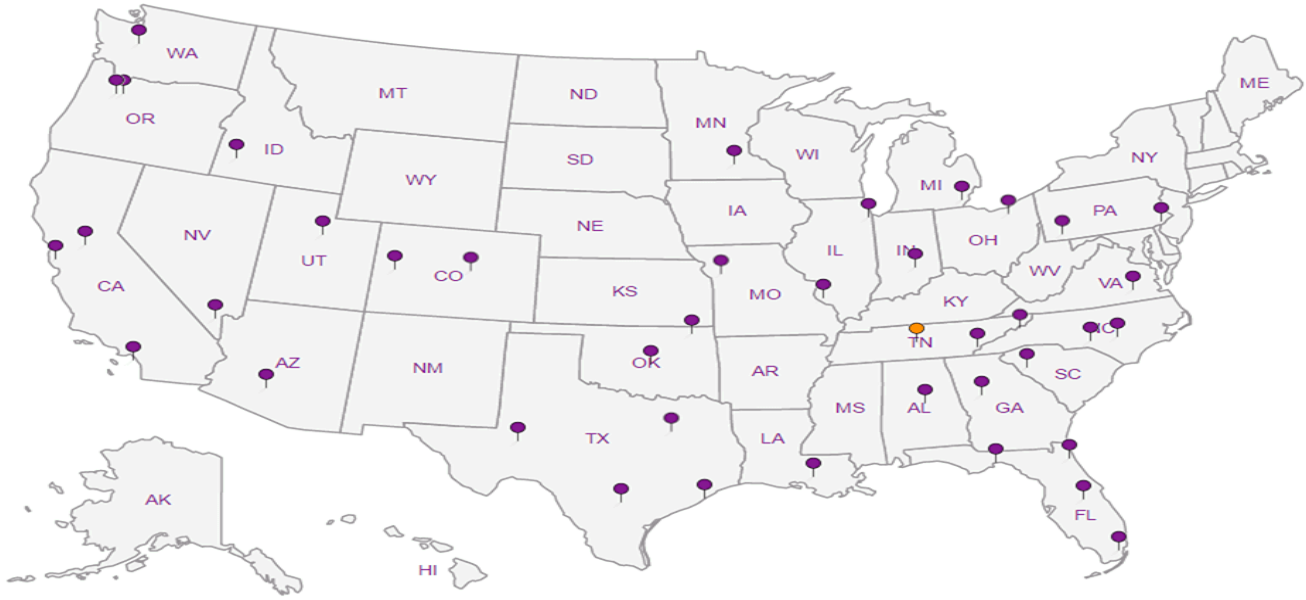
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



GES, Inc. - Concord, CA

5046 Commercial Circle, Ste. F
Concord, CA 94520

Billing Information:
GES Accounts Payable
440 Creamery Way
Ste. 500
Exton, PA 19341

Report to: Mark Peterson

Email To: mpeterson@gesonline.com; mwaters@gesonline.com

Project Description:

City/State Collected:

Phone: 866-507-1411
Fax: 925-825-2021

Client Project # 3016004-800008-206

Lab Project # GESCCA-ANCHORAGE

Collected by (print): Amy Zablocki

Site/Facility ID # 1035 GAMBELL ST.

P.O. #

Collected by (signature): [signature]

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately
Packed on Ice N ___ Y ✓

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1031862
A190

Acctnum: GESCCA
Template: T135052
Prelogin: P673253
TSR: 110 - Brian Ford
PB: TB 9-20-18
Shipped Via: FedEx 2nd Day

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Ctrs	Pres Chk	8270PAHSIMD PAHs 100ml Amb-NoPres	AK101 40mlAmb HCl	AK102/103 100ml Amb HCl	VOCs V8260C 40mlAmb-HCl	trip blk AK101 40mlAmb-HCl-Blk	trip blk VOCs V8260C 40mlAmb-HCl-Blk					Remarks	Sample # (lab only)
~~MW-3~~		~~GW~~				~~10~~		~~X~~	~~X~~	~~X~~	~~X~~								
MW-6	G	GW		10/2/18	1245	10		X	X	X	X								
MW-9	G	GW		10/1/18	1240	10		X	X	X	X								01
MW-16	G	GW		10/1/18	1530	10		X	X	X	X								02
MW-18	G	GW		10/2/18	1550	10		X	X	X	X								03
~~MW-19~~ 2 MW-17	G	GW		10/2/18	1725	10		X	X	X	X								04
~~MW-2~~		~~GW~~				~~8~~			~~X~~	~~X~~	~~X~~								
~~MW-7~~		~~GW~~				~~8~~			~~X~~	~~X~~	~~X~~								
MW-10	G	GW		10/2/18	1410	8			X	X	X								05
~~MW-11~~		~~GW~~				~~8~~			~~X~~	~~X~~	~~X~~								

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 4624 2991 0943

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
[signature]	10/2/18	1852	FEDEX		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.5 +.2 2.5 A: 2.7 °C	Bottles Received: 46
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10/4/18	Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

Login #:1031862	Client:GESCCA	Date:10/4/18	Evaluated by:Carol K

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	X	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Did not receive samples for ID MW-6. Did not receive unpreserved containers for MW-17 8270PAHSIMD analysis

Client informed by:		Call		Email X		Voice Mail		Date:10/05/18	Time:1400
TSR Initials:bjf	Client Contact: Mark Peterson								

Login Instructions:

Proceed without MW-6, will be sent with another batch of samples.
Do not analyze MW-17 for PAHs.

ANALYTICAL REPORT

October 16, 2018

GES, Inc. - Concord, CA

Sample Delivery Group:	L1032176
Samples Received:	10/05/2018
Project Number:	3016004-800008-206
Description:	
Site:	1035 GAMBELL ST.
Report To:	Mark Peterson 5046 Commercial Circle, Ste. F Concord, CA 94520

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

DUP-1 L1032176-01 GW

Collected by	Collected date/time	Received date/time
Amy Zablocki	10/03/18 11:10	10/05/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/08/18 01:04	10/08/18 01:04	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 10:44	10/10/18 10:44	PP
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 20:34	SHG
Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM	WG1178312	1	10/10/18 10:31	10/11/18 15:24	CJR

TRIP BLANK L1032176-02 GW

Collected by	Collected date/time	Received date/time
Amy Zablocki	10/02/18 12:45	10/05/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/07/18 21:00	10/07/18 21:00	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 06:44	10/10/18 06:44	PP

MW-6 L1032176-03 GW

Collected by	Collected date/time	Received date/time
Amy Zablocki	10/02/18 12:45	10/05/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method AK101	WG1177424	1	10/08/18 01:29	10/08/18 01:29	JAH
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1178469	1	10/10/18 11:05	10/10/18 11:05	PP
Semi-Volatile Organic Compounds (GC) by Method AK102/103	WG1178967	1	10/13/18 07:40	10/13/18 20:56	SHG
Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM	WG1178312	1	10/10/18 10:31	10/11/18 15:47	CJR

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	402		10.0	100	1	10/08/2018 01:04	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*89.9*			*50.0-150*		*10/08/2018 01:04*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 10:44	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 10:44	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 10:44	WG1178469
Benzene	U		0.331	1.00	1	10/10/2018 10:44	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 10:44	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 10:44	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 10:44	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 10:44	WG1178469
n-Butylbenzene	6.90		0.361	1.00	1	10/10/2018 10:44	WG1178469
sec-Butylbenzene	U		0.365	1.00	1	10/10/2018 10:44	WG1178469
tert-Butylbenzene	U		0.399	1.00	1	10/10/2018 10:44	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 10:44	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 10:44	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 10:44	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 10:44	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 10:44	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 10:44	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 10:44	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 10:44	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 10:44	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 10:44	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 10:44	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 10:44	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 10:44	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 10:44	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 10:44	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 10:44	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 10:44	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 10:44	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 10:44	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 10:44	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 10:44	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 10:44	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 10:44	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 10:44	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 10:44	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 10:44	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 10:44	WG1178469
Ethylbenzene	0.417	J	0.384	1.00	1	10/10/2018 10:44	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 10:44	WG1178469
Isopropylbenzene	0.390	J	0.326	1.00	1	10/10/2018 10:44	WG1178469
p-Isopropyltoluene	9.29		0.350	1.00	1	10/10/2018 10:44	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 10:44	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 10:44	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 10:44	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 10:44	WG1178469
Naphthalene	22.0		1.00	5.00	1	10/10/2018 10:44	WG1178469
n-Propylbenzene	1.01		0.349	1.00	1	10/10/2018 10:44	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 10:44	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 10:44	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 10:44	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 10:44	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 10:44	WG1178469
Toluene	U		0.412	1.00	1	10/10/2018 10:44	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 10:44	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 10:44	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 10:44	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 10:44	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 10:44	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 10:44	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 10:44	WG1178469
1,2,4-Trimethylbenzene	167		0.373	1.00	1	10/10/2018 10:44	WG1178469
1,2,3-Trimethylbenzene	48.8		0.321	1.00	1	10/10/2018 10:44	WG1178469
1,3,5-Trimethylbenzene	75.9		0.387	1.00	1	10/10/2018 10:44	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 10:44	WG1178469
Xylenes, Total	21.4		1.06	3.00	1	10/10/2018 10:44	WG1178469
(S) Toluene-d8	*108*			*80.0-120*		*10/10/2018 10:44*	WG1178469
(S) Dibromofluoromethane	*109*			*75.0-120*		*10/10/2018 10:44*	WG1178469
(S) 4-Bromofluorobenzene	*106*			*77.0-126*		*10/10/2018 10:44*	WG1178469

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	2820		170	800	1	10/13/2018 20:34	WG1178967
AK103 RRO C25-C36	526	J	460	800	1	10/13/2018 20:34	WG1178967
(S) o-Terphenyl	*87.3*			*50.0-150*		*10/13/2018 20:34*	WG1178967
(S) n-Triacontane d62	*36.7*	J2		*50.0-150*		*10/13/2018 20:34*	WG1178967

Sample Narrative:

L1032176-01 WG1178967: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	0.00992	J	0.00800	0.0500	1	10/11/2018 15:24	WG1178312
Acenaphthene	0.462		0.0100	0.0500	1	10/11/2018 15:24	WG1178312
Acenaphthylene	U		0.00700	0.0500	1	10/11/2018 15:24	WG1178312
Benzo(a)anthracene	U		0.00830	0.0500	1	10/11/2018 15:24	WG1178312
Benzo(a)pyrene	U		0.0158	0.0500	1	10/11/2018 15:24	WG1178312
Benzo(b)fluoranthene	U		0.00212	0.0500	1	10/11/2018 15:24	WG1178312
Benzo(g,h,i)perylene	U		0.00227	0.0500	1	10/11/2018 15:24	WG1178312
Benzo(k)fluoranthene	U		0.0255	0.0500	1	10/11/2018 15:24	WG1178312
Chrysene	U		0.0144	0.0500	1	10/11/2018 15:24	WG1178312
Dibenz(a,h)anthracene	U		0.00454	0.0500	1	10/11/2018 15:24	WG1178312
Fluoranthene	U		0.0165	0.0500	1	10/11/2018 15:24	WG1178312
Fluorene	0.279		0.00898	0.0500	1	10/11/2018 15:24	WG1178312
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500	1	10/11/2018 15:24	WG1178312
Naphthalene	6.45		0.0123	0.250	1	10/11/2018 15:24	WG1178312
Phenanthrene	U		0.0184	0.0500	1	10/11/2018 15:24	WG1178312
Pyrene	U		0.0155	0.0500	1	10/11/2018 15:24	WG1178312
1-Methylnaphthalene	8.29		0.0189	0.250	1	10/11/2018 15:24	WG1178312
2-Methylnaphthalene	1.23		0.0155	0.250	1	10/11/2018 15:24	WG1178312
2-Chloronaphthalene	U		0.0165	0.250	1	10/11/2018 15:24	WG1178312
(S) Nitrobenzene-d5	*52.2*			*11.0-135*		*10/11/2018 15:24*	WG1178312

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
(S) 2-Fluorobiphenyl	*87.6*			*32.0-120*		*10/11/2018 15:24*	WG1178312
(S) p-Terphenyl-d14	*120*			*23.0-122*		*10/11/2018 15:24*	WG1178312

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	U		10.0	100	1	10/07/2018 21:00	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*86.0*			*50.0-150*		*10/07/2018 21:00*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	U		10.0	50.0	1	10/10/2018 06:44	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 06:44	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 06:44	WG1178469
Benzene	U		0.331	1.00	1	10/10/2018 06:44	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 06:44	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 06:44	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 06:44	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 06:44	WG1178469
n-Butylbenzene	U		0.361	1.00	1	10/10/2018 06:44	WG1178469
sec-Butylbenzene	U		0.365	1.00	1	10/10/2018 06:44	WG1178469
tert-Butylbenzene	U		0.399	1.00	1	10/10/2018 06:44	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 06:44	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 06:44	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 06:44	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 06:44	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 06:44	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 06:44	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 06:44	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 06:44	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 06:44	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 06:44	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 06:44	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 06:44	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 06:44	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 06:44	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 06:44	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 06:44	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 06:44	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 06:44	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 06:44	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 06:44	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 06:44	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 06:44	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 06:44	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 06:44	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 06:44	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 06:44	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 06:44	WG1178469
Ethylbenzene	U		0.384	1.00	1	10/10/2018 06:44	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 06:44	WG1178469
Isopropylbenzene	U		0.326	1.00	1	10/10/2018 06:44	WG1178469
p-Isopropyltoluene	U		0.350	1.00	1	10/10/2018 06:44	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 06:44	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 06:44	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 06:44	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 06:44	WG1178469
Naphthalene	U		1.00	5.00	1	10/10/2018 06:44	WG1178469
n-Propylbenzene	U		0.349	1.00	1	10/10/2018 06:44	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 06:44	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 06:44	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 06:44	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 06:44	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 06:44	WG1178469
Toluene	U		0.412	1.00	1	10/10/2018 06:44	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 06:44	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 06:44	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 06:44	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 06:44	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 06:44	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 06:44	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 06:44	WG1178469
1,2,4-Trimethylbenzene	U		0.373	1.00	1	10/10/2018 06:44	WG1178469
1,2,3-Trimethylbenzene	U		0.321	1.00	1	10/10/2018 06:44	WG1178469
1,3,5-Trimethylbenzene	U		0.387	1.00	1	10/10/2018 06:44	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 06:44	WG1178469
Xylenes, Total	U		1.06	3.00	1	10/10/2018 06:44	WG1178469
(S) Toluene-d8	*111*			*80.0-120*		*10/10/2018 06:44*	WG1178469
(S) Dibromofluoromethane	*108*			*75.0-120*		*10/10/2018 06:44*	WG1178469
(S) 4-Bromofluorobenzene	*96.6*			*77.0-126*		*10/10/2018 06:44*	WG1178469

Volatile Organic Compounds (GC) by Method AK101

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
TPHGAK C6 to C10	594		10.0	100	1	10/08/2018 01:29	WG1177424
(S) a,a,a-Trifluorotoluene(FID)	*116*			*50.0-150*		*10/08/2018 01:29*	WG1177424

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	36.5	J	10.0	50.0	1	10/10/2018 11:05	WG1178469
Acrolein	U		8.87	50.0	1	10/10/2018 11:05	WG1178469
Acrylonitrile	U		1.87	10.0	1	10/10/2018 11:05	WG1178469
Benzene	12.0		0.331	1.00	1	10/10/2018 11:05	WG1178469
Bromobenzene	U		0.352	1.00	1	10/10/2018 11:05	WG1178469
Bromodichloromethane	U		0.380	1.00	1	10/10/2018 11:05	WG1178469
Bromoform	U		0.469	1.00	1	10/10/2018 11:05	WG1178469
Bromomethane	U		0.866	5.00	1	10/10/2018 11:05	WG1178469
n-Butylbenzene	3.07		0.361	1.00	1	10/10/2018 11:05	WG1178469
sec-Butylbenzene	4.80		0.365	1.00	1	10/10/2018 11:05	WG1178469
tert-Butylbenzene	0.600	J	0.399	1.00	1	10/10/2018 11:05	WG1178469
Carbon tetrachloride	U		0.379	1.00	1	10/10/2018 11:05	WG1178469
Chlorobenzene	U		0.348	1.00	1	10/10/2018 11:05	WG1178469
Chlorodibromomethane	U		0.327	1.00	1	10/10/2018 11:05	WG1178469
Chloroethane	U		0.453	5.00	1	10/10/2018 11:05	WG1178469
Chloroform	U		0.324	5.00	1	10/10/2018 11:05	WG1178469
Chloromethane	U		0.276	2.50	1	10/10/2018 11:05	WG1178469
2-Chlorotoluene	U		0.375	1.00	1	10/10/2018 11:05	WG1178469
4-Chlorotoluene	U		0.351	1.00	1	10/10/2018 11:05	WG1178469
1,2-Dibromo-3-Chloropropane	U		1.33	5.00	1	10/10/2018 11:05	WG1178469
1,2-Dibromoethane	U		0.381	1.00	1	10/10/2018 11:05	WG1178469
Dibromomethane	U		0.346	1.00	1	10/10/2018 11:05	WG1178469
1,2-Dichlorobenzene	U		0.349	1.00	1	10/10/2018 11:05	WG1178469
1,3-Dichlorobenzene	U		0.220	1.00	1	10/10/2018 11:05	WG1178469
1,4-Dichlorobenzene	U		0.274	1.00	1	10/10/2018 11:05	WG1178469
Dichlorodifluoromethane	U		0.551	5.00	1	10/10/2018 11:05	WG1178469
1,1-Dichloroethane	U		0.259	1.00	1	10/10/2018 11:05	WG1178469
1,2-Dichloroethane	U		0.361	1.00	1	10/10/2018 11:05	WG1178469
1,1-Dichloroethene	U		0.398	1.00	1	10/10/2018 11:05	WG1178469
cis-1,2-Dichloroethene	U		0.260	1.00	1	10/10/2018 11:05	WG1178469
trans-1,2-Dichloroethene	U		0.396	1.00	1	10/10/2018 11:05	WG1178469
1,2-Dichloropropane	U		0.306	1.00	1	10/10/2018 11:05	WG1178469
1,1-Dichloropropene	U		0.352	1.00	1	10/10/2018 11:05	WG1178469
1,3-Dichloropropane	U		0.366	1.00	1	10/10/2018 11:05	WG1178469
cis-1,3-Dichloropropene	U		0.418	1.00	1	10/10/2018 11:05	WG1178469
trans-1,3-Dichloropropene	U		0.419	1.00	1	10/10/2018 11:05	WG1178469
2,2-Dichloropropane	U		0.321	1.00	1	10/10/2018 11:05	WG1178469
Di-isopropyl ether	U		0.320	1.00	1	10/10/2018 11:05	WG1178469
Ethylbenzene	33.7		0.384	1.00	1	10/10/2018 11:05	WG1178469
Hexachloro-1,3-butadiene	U		0.256	1.00	1	10/10/2018 11:05	WG1178469
Isopropylbenzene	15.3		0.326	1.00	1	10/10/2018 11:05	WG1178469
p-Isopropyltoluene	8.07		0.350	1.00	1	10/10/2018 11:05	WG1178469
2-Butanone (MEK)	U		3.93	10.0	1	10/10/2018 11:05	WG1178469
Methylene Chloride	U		1.00	5.00	1	10/10/2018 11:05	WG1178469
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0	1	10/10/2018 11:05	WG1178469
Methyl tert-butyl ether	U		0.367	1.00	1	10/10/2018 11:05	WG1178469
Naphthalene	9.82		1.00	5.00	1	10/10/2018 11:05	WG1178469
n-Propylbenzene	26.9		0.349	1.00	1	10/10/2018 11:05	WG1178469
Styrene	U		0.307	1.00	1	10/10/2018 11:05	WG1178469

Volatile Organic Compounds (GC/MS) by Method 8260C

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	U		0.385	1.00	1	10/10/2018 11:05	WG1178469
1,1,2,2-Tetrachloroethane	U		0.130	1.00	1	10/10/2018 11:05	WG1178469
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00	1	10/10/2018 11:05	WG1178469
Tetrachloroethene	U		0.372	1.00	1	10/10/2018 11:05	WG1178469
Toluene	4.91		0.412	1.00	1	10/10/2018 11:05	WG1178469
1,2,3-Trichlorobenzene	U		0.230	1.00	1	10/10/2018 11:05	WG1178469
1,2,4-Trichlorobenzene	U		0.355	1.00	1	10/10/2018 11:05	WG1178469
1,1,1-Trichloroethane	U		0.319	1.00	1	10/10/2018 11:05	WG1178469
1,1,2-Trichloroethane	U		0.383	1.00	1	10/10/2018 11:05	WG1178469
Trichloroethene	U		0.398	1.00	1	10/10/2018 11:05	WG1178469
Trichlorofluoromethane	U		1.20	5.00	1	10/10/2018 11:05	WG1178469
1,2,3-Trichloropropane	U		0.807	2.50	1	10/10/2018 11:05	WG1178469
1,2,4-Trimethylbenzene	133		0.373	1.00	1	10/10/2018 11:05	WG1178469
1,2,3-Trimethylbenzene	36.1		0.321	1.00	1	10/10/2018 11:05	WG1178469
1,3,5-Trimethylbenzene	19.9		0.387	1.00	1	10/10/2018 11:05	WG1178469
Vinyl chloride	U		0.259	1.00	1	10/10/2018 11:05	WG1178469
Xylenes, Total	146		1.06	3.00	1	10/10/2018 11:05	WG1178469
(S) Toluene-d8	*108*			*80.0-120*		*10/10/2018 11:05*	WG1178469
(S) Dibromofluoromethane	*114*			*75.0-120*		*10/10/2018 11:05*	WG1178469
(S) 4-Bromofluorobenzene	*98.9*			*77.0-126*		*10/10/2018 11:05*	WG1178469

Semi-Volatile Organic Compounds (GC) by Method AK102/103

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
AK102 DRO C10-C25	4820		170	800	1	10/13/2018 20:56	WG1178967
AK103 RRO C25-C36	1170		460	800	1	10/13/2018 20:56	WG1178967
(S) o-Terphenyl	*90.5*			*50.0-150*		*10/13/2018 20:56*	WG1178967
(S) n-Triacontane d62	*41.3*	J2		*50.0-150*		*10/13/2018 20:56*	WG1178967

Sample Narrative:

L1032176-03 WG1178967: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Anthracene	0.0193	J	0.00800	0.0500	1	10/11/2018 15:47	WG1178312
Acenaphthene	0.303		0.0100	0.0500	1	10/11/2018 15:47	WG1178312
Acenaphthylene	U		0.00700	0.0500	1	10/11/2018 15:47	WG1178312
Benzo(a)anthracene	U		0.00830	0.0500	1	10/11/2018 15:47	WG1178312
Benzo(a)pyrene	U		0.0158	0.0500	1	10/11/2018 15:47	WG1178312
Benzo(b)fluoranthene	U		0.00212	0.0500	1	10/11/2018 15:47	WG1178312
Benzo(g,h,i)perylene	U		0.00227	0.0500	1	10/11/2018 15:47	WG1178312
Benzo(k)fluoranthene	U		0.0255	0.0500	1	10/11/2018 15:47	WG1178312
Chrysene	U		0.0144	0.0500	1	10/11/2018 15:47	WG1178312
Dibenz(a,h)anthracene	U		0.00454	0.0500	1	10/11/2018 15:47	WG1178312
Fluoranthene	U		0.0165	0.0500	1	10/11/2018 15:47	WG1178312
Fluorene	0.0529		0.00898	0.0500	1	10/11/2018 15:47	WG1178312
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500	1	10/11/2018 15:47	WG1178312
Naphthalene	6.10		0.0123	0.250	1	10/11/2018 15:47	WG1178312
Phenanthrene	U		0.0184	0.0500	1	10/11/2018 15:47	WG1178312
Pyrene	U		0.0155	0.0500	1	10/11/2018 15:47	WG1178312
1-Methylnaphthalene	10.3		0.0189	0.250	1	10/11/2018 15:47	WG1178312
2-Methylnaphthalene	0.890		0.0155	0.250	1	10/11/2018 15:47	WG1178312
2-Chloronaphthalene	U		0.0165	0.250	1	10/11/2018 15:47	WG1178312
(S) Nitrobenzene-d5	*52.9*			*11.0-135*		*10/11/2018 15:47*	WG1178312

Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
(S) 2-Fluorobiphenyl	*88.6*			*32.0-120*		*10/11/2018 15:47*	WG1178312
(S) p-Terphenyl-d14	*123*	J1		*23.0-122*		*10/11/2018 15:47*	WG1178312

Method Blank (MB)

(MB) R3348920-2 10/07/18 20:15

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
TPHGAK C6 to C10	U		10.0	100
(S) a,a,a-Trifluorotoluene(FID)	*84.2*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3348920-1 10/07/18 19:27 • (LCSD) R3348920-3 10/08/18 07:00

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPHGAK C6 to C10	400	377	366	94.2	91.4	60.0-120			3.05	20
(S) a,a,a-Trifluorotoluene(FID)				*86.5*	*85.2*	*50.0-150*				

Method Blank (MB)

(MB) R3349471-3 10/10/18 06:24

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		10.0	50.0
Acrolein	U		8.87	50.0
Acrylonitrile	U		1.87	10.0
Benzene	U		0.331	1.00
Bromobenzene	U		0.352	1.00
Bromodichloromethane	U		0.380	1.00
Bromoform	U		0.469	1.00
Bromomethane	U		0.866	5.00
n-Butylbenzene	U		0.361	1.00
sec-Butylbenzene	U		0.365	1.00
tert-Butylbenzene	U		0.399	1.00
Carbon tetrachloride	U		0.379	1.00
Chlorobenzene	U		0.348	1.00
Chlorodibromomethane	U		0.327	1.00
Chloroethane	U		0.453	5.00
Chloroform	U		0.324	5.00
Chloromethane	U		0.276	2.50
2-Chlorotoluene	U		0.375	1.00
4-Chlorotoluene	U		0.351	1.00
1,2-Dibromo-3-Chloropropane	U		1.33	5.00
1,2-Dibromoethane	U		0.381	1.00
Dibromomethane	U		0.346	1.00
1,2-Dichlorobenzene	U		0.349	1.00
1,3-Dichlorobenzene	U		0.220	1.00
1,4-Dichlorobenzene	U		0.274	1.00
Dichlorodifluoromethane	U		0.551	5.00
1,1-Dichloroethane	U		0.259	1.00
1,2-Dichloroethane	U		0.361	1.00
1,1-Dichloroethene	U		0.398	1.00
cis-1,2-Dichloroethene	U		0.260	1.00
trans-1,2-Dichloroethene	U		0.396	1.00
1,2-Dichloropropane	U		0.306	1.00
1,1-Dichloropropene	U		0.352	1.00
1,3-Dichloropropane	U		0.366	1.00
cis-1,3-Dichloropropene	U		0.418	1.00
trans-1,3-Dichloropropene	U		0.419	1.00
2,2-Dichloropropane	U		0.321	1.00
Di-isopropyl ether	U		0.320	1.00
Ethylbenzene	U		0.384	1.00
Hexachloro-1,3-butadiene	0.401	J	0.256	1.00

Method Blank (MB)

(MB) R3349471-3 10/10/18 06:24

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Isopropylbenzene	U		0.326	1.00
p-Isopropyltoluene	U		0.350	1.00
2-Butanone (MEK)	U		3.93	10.0
Methylene Chloride	U		1.00	5.00
4-Methyl-2-pentanone (MIBK)	U		2.14	10.0
Methyl tert-butyl ether	U		0.367	1.00
Naphthalene	U		1.00	5.00
n-Propylbenzene	U		0.349	1.00
Styrene	U		0.307	1.00
1,1,1,2-Tetrachloroethane	U		0.385	1.00
1,1,2,2-Tetrachloroethane	U		0.130	1.00
Tetrachloroethene	U		0.372	1.00
Toluene	U		0.412	1.00
1,1,2-Trichlorotrifluoroethane	U		0.303	1.00
1,2,3-Trichlorobenzene	0.304	J	0.230	1.00
1,2,4-Trichlorobenzene	U		0.355	1.00
1,1,1-Trichloroethane	U		0.319	1.00
1,1,2-Trichloroethane	U		0.383	1.00
Trichloroethene	U		0.398	1.00
Trichlorofluoromethane	U		1.20	5.00
1,2,3-Trichloropropane	U		0.807	2.50
1,2,3-Trimethylbenzene	U		0.321	1.00
1,2,4-Trimethylbenzene	U		0.373	1.00
1,3,5-Trimethylbenzene	U		0.387	1.00
Vinyl chloride	U		0.259	1.00
Xylenes, Total	U		1.06	3.00
(S) Toluene-d8	*101*			*80.0-120*
(S) Dibromofluoromethane	*108*			*75.0-120*
(S) 4-Bromofluorobenzene	*107*			*77.0-126*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349471-1 10/10/18 05:24 • (LCSD) R3349471-2 10/10/18 05:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	125	178	148	142	118	19.0-160			18.1	27
Acrolein	125	124	101	99.3	80.9	10.0-160			20.4	26
Acrylonitrile	125	143	136	114	109	55.0-149			5.28	20
Benzene	25.0	23.8	22.6	95.2	90.4	70.0-123			5.19	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349471-1 10/10/18 05:24 • (LCSD) R3349471-2 10/10/18 05:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromobenzene	25.0	23.0	21.5	92.0	86.1	73.0-121			6.65	20
Bromodichloromethane	25.0	23.9	23.7	95.7	94.9	75.0-120			0.833	20
Bromoform	25.0	22.7	22.3	90.8	89.4	68.0-132			1.62	20
Bromomethane	25.0	20.1	19.9	80.4	79.5	10.0-160			1.19	25
n-Butylbenzene	25.0	22.7	20.8	90.8	83.4	73.0-125			8.56	20
sec-Butylbenzene	25.0	24.6	23.8	98.3	95.0	75.0-125			3.35	20
tert-Butylbenzene	25.0	26.2	24.4	105	97.6	76.0-124			7.22	20
Carbon tetrachloride	25.0	23.0	22.9	92.1	91.6	68.0-126			0.598	20
Chlorobenzene	25.0	28.8	26.9	115	108	80.0-121			6.58	20
Chlorodibromomethane	25.0	28.8	26.9	115	108	77.0-125			6.85	20
Chloroethane	25.0	21.3	21.0	85.0	83.9	47.0-150			1.40	20
Chloroform	25.0	24.8	23.3	99.3	93.2	73.0-120			6.26	20
Chloromethane	25.0	22.9	19.7	91.7	78.8	41.0-142			15.1	20
2-Chlorotoluene	25.0	24.8	23.1	99.2	92.3	76.0-123			7.18	20
4-Chlorotoluene	25.0	24.5	24.4	97.9	97.8	75.0-122			0.154	20
1,2-Dibromo-3-Chloropropane	25.0	25.1	23.8	100	95.1	58.0-134			5.25	20
1,2-Dibromoethane	25.0	29.1	26.1	116	104	80.0-122			11.0	20
Dibromomethane	25.0	24.1	22.7	96.4	90.7	80.0-120			6.17	20
1,2-Dichlorobenzene	25.0	25.0	24.7	100	98.7	79.0-121			1.31	20
1,3-Dichlorobenzene	25.0	26.3	25.1	105	100	79.0-120			4.93	20
1,4-Dichlorobenzene	25.0	24.5	24.7	98.1	98.8	79.0-120			0.681	20
Dichlorodifluoromethane	25.0	25.5	23.7	102	94.9	51.0-149			7.09	20
1,1-Dichloroethane	25.0	23.2	22.2	92.9	88.9	70.0-126			4.41	20
1,2-Dichloroethane	25.0	25.1	24.5	100	98.0	70.0-128			2.27	20
1,1-Dichloroethene	25.0	25.6	24.5	102	98.0	71.0-124			4.39	20
cis-1,2-Dichloroethene	25.0	25.1	23.7	100	94.6	73.0-120			5.85	20
trans-1,2-Dichloroethene	25.0	24.8	22.3	99.3	89.3	73.0-120			10.6	20
1,2-Dichloropropane	25.0	24.9	24.6	99.7	98.5	77.0-125			1.28	20
1,1-Dichloropropene	25.0	23.2	23.0	92.6	92.2	74.0-126			0.448	20
1,3-Dichloropropane	25.0	26.2	23.5	105	93.8	80.0-120			11.2	20
cis-1,3-Dichloropropene	25.0	24.2	23.8	96.6	95.3	80.0-123			1.40	20
trans-1,3-Dichloropropene	25.0	26.2	24.2	105	96.8	78.0-124			8.04	20
2,2-Dichloropropane	25.0	22.8	22.0	91.4	88.1	58.0-130			3.64	20
Di-isopropyl ether	25.0	29.3	26.2	117	105	58.0-138			11.1	20
Ethylbenzene	25.0	29.4	27.4	118	110	79.0-123			7.02	20
Hexachloro-1,3-butadiene	25.0	19.3	21.2	77.0	84.9	54.0-138			9.66	20
Isopropylbenzene	25.0	24.7	24.0	98.7	96.1	76.0-127			2.68	20
p-Isopropyltoluene	25.0	24.8	23.5	99.3	94.0	76.0-125			5.49	20
2-Butanone (MEK)	125	158	147	126	118	44.0-160			6.95	20
Methylene Chloride	25.0	23.0	20.5	91.9	81.8	67.0-120			11.6	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349471-1 10/10/18 05:24 • (LCSD) R3349471-2 10/10/18 05:44

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	125	167	153	134	122	68.0-142			9.00	20
Methyl tert-butyl ether	25.0	23.7	22.5	94.9	89.9	68.0-125			5.46	20
Naphthalene	25.0	23.0	22.8	91.8	91.0	54.0-135			0.851	20
n-Propylbenzene	25.0	25.2	24.1	101	96.3	77.0-124			4.64	20
Styrene	25.0	25.4	23.6	102	94.2	73.0-130			7.53	20
1,1,1,2-Tetrachloroethane	25.0	28.9	27.7	115	111	75.0-125			3.95	20
1,1,2,2-Tetrachloroethane	25.0	23.5	21.4	94.0	85.4	65.0-130			9.53	20
Tetrachloroethene	25.0	28.1	26.4	112	106	72.0-132			6.14	20
Toluene	25.0	27.8	25.0	111	100	79.0-120			10.7	20
1,1,2-Trichlorotrifluoroethane	25.0	24.7	23.8	98.8	95.2	69.0-132			3.72	20
1,2,3-Trichlorobenzene	25.0	19.8	21.2	79.2	85.0	50.0-138			7.07	20
1,2,4-Trichlorobenzene	25.0	22.6	22.7	90.4	90.7	57.0-137			0.332	20
1,1,1-Trichloroethane	25.0	25.7	24.5	103	98.0	73.0-124			4.85	20
1,1,2-Trichloroethane	25.0	27.5	25.8	110	103	80.0-120			6.36	20
Trichloroethene	25.0	26.3	25.7	105	103	78.0-124			2.18	20
Trichlorofluoromethane	25.0	24.4	24.2	97.6	97.0	59.0-147			0.652	20
1,2,3-Trichloropropane	25.0	24.7	24.8	98.9	99.3	73.0-130			0.372	20
1,2,3-Trimethylbenzene	25.0	24.7	24.1	98.9	96.5	77.0-120			2.46	20
1,2,4-Trimethylbenzene	25.0	25.4	24.3	101	97.4	76.0-121			4.08	20
1,3,5-Trimethylbenzene	25.0	24.5	24.1	98.0	96.5	76.0-122			1.62	20
Vinyl chloride	25.0	22.4	21.9	89.4	87.6	67.0-131			2.08	20
Xylenes, Total	75.0	88.0	79.9	117	107	79.0-123			9.65	20
(S) Toluene-d8				*114*	*108*	*80.0-120*				
(S) Dibromofluoromethane				*100*	*103*	*75.0-120*				
(S) 4-Bromofluorobenzene				*94.4*	*102*	*77.0-126*				

Method Blank (MB)

(MB) R3350439-1 10/13/18 16:53

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
AK102 DRO C10-C25	U		170	800
AK103 RRO C25-C36	U		460	800
(S) n-Triacontane d62	*95.6*			*50.0-150*
(S) o-Terphenyl	*73.0*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3350439-2 10/13/18 17:15 • (LCSD) R3350439-3 10/13/18 17:37

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	3000	2760	3090	92.0	103	75.0-125			11.3	20
(S) n-Triacontane d62				*64.3*	*65.6*	*50.0-150*				
(S) o-Terphenyl				*97.5*	*99.0*	*50.0-150*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3350439-4 10/13/18 17:59 • (LCSD) R3350439-5 10/13/18 18:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK103 RRO C25-C36	3000	2910	3020	97.0	101	60.0-120			3.71	20
(S) n-Triacontane d62				*190*	*188*	*50.0-150*	J1	J1		
(S) o-Terphenyl				*78.3*	*82.2*	*50.0-150*				

Method Blank (MB)

(MB) R3349649-1 10/11/18 09:26

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Anthracene	U		0.00800	0.0500
Acenaphthene	U		0.0100	0.0500
Acenaphthylene	U		0.00700	0.0500
Benzo(a)anthracene	U		0.00830	0.0500
Benzo(a)pyrene	U		0.0158	0.0500
Benzo(b)fluoranthene	U		0.00212	0.0500
Benzo(g,h,i)perylene	0.00238	J	0.00227	0.0500
Benzo(k)fluoranthene	U		0.0255	0.0500
Chrysene	U		0.0144	0.0500
Dibenz(a,h)anthracene	U		0.00454	0.0500
Fluoranthene	U		0.0165	0.0500
Fluorene	U		0.00898	0.0500
Indeno(1,2,3-cd)pyrene	U		0.00739	0.0500
Naphthalene	U		0.0123	0.250
Phenanthrene	U		0.0184	0.0500
Pyrene	U		0.0155	0.0500
1-Methylnaphthalene	U		0.0189	0.250
2-Methylnaphthalene	U		0.0155	0.250
2-Chloronaphthalene	U		0.0165	0.250
(S) Nitrobenzene-d5	*61.5*			*11.0-135*
(S) 2-Fluorobiphenyl	*103*			*32.0-120*
(S) p-Terphenyl-d14	*112*			*23.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349649-2 10/11/18 09:49 • (LCSD) R3349649-3 10/11/18 10:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Anthracene	2.00	1.98	2.18	99.0	109	43.0-127			9.62	20
Acenaphthene	2.00	2.06	2.23	103	111	42.0-120			7.93	20
Acenaphthylene	2.00	1.86	2.07	93.0	103	43.0-120			10.7	20
Benzo(a)anthracene	2.00	2.08	2.23	104	111	46.0-120			6.96	20
Benzo(a)pyrene	2.00	2.02	2.21	101	111	44.0-122			8.98	20
Benzo(b)fluoranthene	2.00	2.12	2.33	106	117	43.0-122			9.44	20
Benzo(g,h,i)perylene	2.00	2.23	2.43	111	122	25.0-137			8.58	23
Benzo(k)fluoranthene	2.00	2.27	2.31	114	115	39.0-128			1.75	22
Chrysene	2.00	2.24	2.35	112	117	42.0-129			4.79	20
Dibenz(a,h)anthracene	2.00	2.20	2.46	110	123	25.0-139			11.2	22
Fluoranthene	2.00	2.41	2.56	120	128	48.0-131			6.04	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349649-2 10/11/18 09:49 • (LCSD) R3349649-3 10/11/18 10:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Fluorene	2.00	1.89	2.01	94.5	100	42.0-120			6.15	20
Indeno(1,2,3-cd)pyrene	2.00	2.30	2.51	115	125	37.0-133			8.73	20
Naphthalene	2.00	1.50	1.71	75.0	85.5	30.0-120			13.1	22
Phenanthrene	2.00	1.97	2.10	98.5	105	42.0-120			6.39	20
Pyrene	2.00	2.06	2.17	103	108	38.0-124			5.20	20
1-Methylnaphthalene	2.00	1.81	1.98	90.5	99.0	43.0-120			8.97	20
2-Methylnaphthalene	2.00	1.70	1.89	85.0	94.5	40.0-120			10.6	20
2-Chloronaphthalene	2.00	1.91	2.07	95.5	103	39.0-120			8.04	20
(S) Nitrobenzene-d5				*58.5*	*66.0*	*11.0-135*				
(S) 2-Fluorobiphenyl				*103*	*111*	*32.0-120*				
(S) p-Terphenyl-d14				*114*	*119*	*23.0-122*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

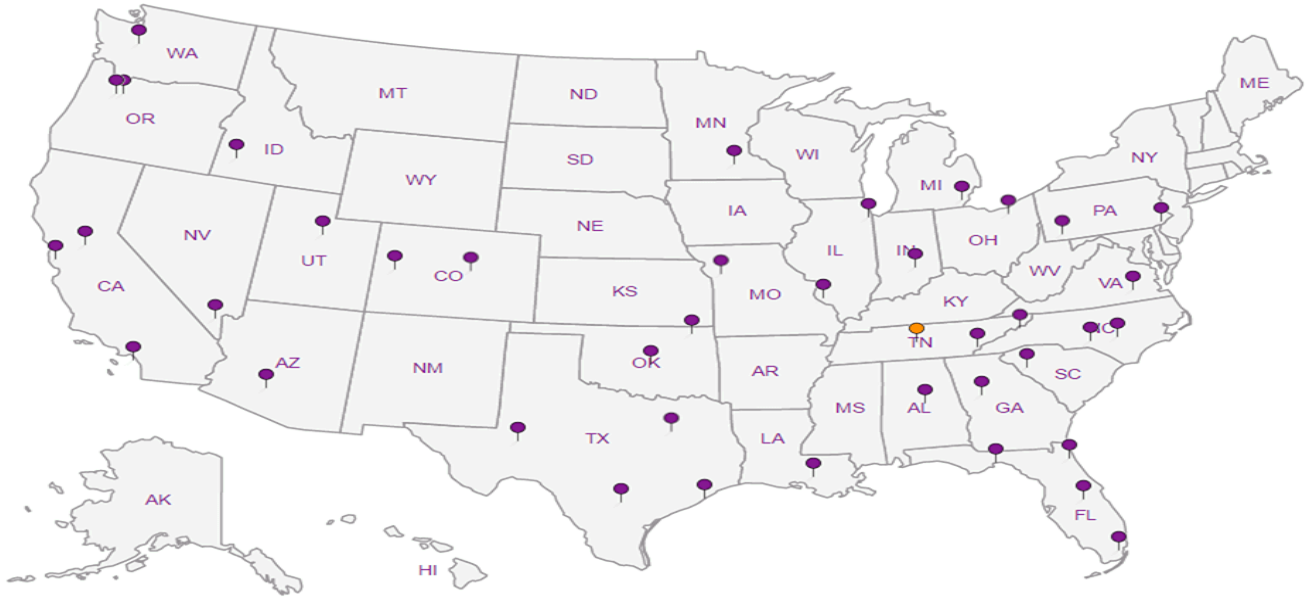
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



GES, Inc. - Concord, CA

5046 Commercial Circle, Ste. F
Concord, CA 94520

Billing Information:
GES Accounts Payable
440 Creamery Way
Ste. 500
Exton, PA 19341

Report to: Mark Peterson

Email To: mpeterson@gesonline.com; mwaters@gesonline.com

Project Description:

City/State Collected:

Phone: 866-507-1411
Fax: 925-825-2021

Client Project # 3016004-800008-206

Lab Project # GESCCA-ANCHORAGE

Collected by (print): Amy Zablock

Site/Facility ID # 1035 GAMBELL ST.

P.O. #

Collected by (signature):

Quote #

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Pres Chk: 2

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	8270PAHsSIMD PAHs 100ml Amb-NoPres	AK101 40mlAmb HCl	AK102/103 100ml Amb HCl	VOCs V8260C 40mlAmb-HCl	trip blk AK101 40mlAmb-HCl-Blk	trip blk VOCs V8260C 40mlAmb-HCl-Blk				Remarks	Sample # (lab only)
~~MW-17~~		GW				8		X	X	X							
~~RW-12~~		GW				8		X	X	X							
DUP-1 (~~MW-16~~)		GW		10/3/18	1110	10 8	X	X	X	X							01
TRIP BLANK		GW		10/2/18	1245	2					X	X					02
MW-6		GW		10/2/18	1245	10	X	X	X	X							03

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: MW-6 was included on COC for samples shipped 10/2/18 but left out of cooler

pH ____ Temp ____
RAD SCREEN: <0.5 mR/hr
Other ____

Samples returned via: __ UPS ✓ FedEx __ Courier ____

Tracking # 4624 2991 0954

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR	
	10/3/18	1854	FEDEX	1	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.5/4.4 °C	Bottles Received: 20
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10/5/18	Time: 0845

Hold:

If preservation required by Login: Date/Time

Condition: NCF OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP X Y __N
COC Signed/Accurate: X Y __N
Bottles arrive intact: X Y __N
Correct bottles used: X Y __N
Sufficient volume sent: X Y __N
If Applicable
VOA Zero Headspace: X Y __N
Preservation Correct/Checked: X Y __N

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1032176
B150

Acctnum: GESCCA
Template: T135052
Prelogin: P673253
TSR: 110 - Brian Ford
PB: TB 9-20-18
Shipped Via: FedEx 2nd Day

ANALYTICAL REPORT

October 11, 2018

GES, Inc. - Concord, CA

Sample Delivery Group:	L1032095
Samples Received:	10/05/2018
Project Number:	3016004-800008-206
Description:	
Site:	1035 GAMBELL ST.
Report To:	Mark Peterson 5046 Commercial Circle, Ste. F Concord, CA 94520

Entire Report Reviewed By:

Brian Ford

Brian Ford
Project Manager

TABLE OF CONTENTS

SV-1 L1032095-01 Air

Collected by	Collected date/time	Received date/time
Amy Zablocki	10/03/18 10:25	10/05/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method ASTM 1946	WG1177897	1	10/09/18 14:20	10/09/18 14:20	AMC
Volatile Organic Compounds (MS) by Method TO-15	WG1176996	2	10/06/18 20:43	10/06/18 20:43	AMC

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford

Brian Ford
Project Manager

Volatile Organic Compounds (GC) by Method ASTM 1946

Analyte	CAS #	Mol. Wt.	RDL %	Result %	Qualifier	Dilution	Batch
Helium	7440-59-7		0.100	ND		1	WG1177897

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	2.50	5.94	3.38	8.04		2	WG1176996
Allyl chloride	107-05-1	76.53	0.400	1.25	ND	ND		2	WG1176996
Benzene	71-43-2	78.10	0.400	1.28	0.956	3.05		2	WG1176996
Benzyl Chloride	100-44-7	127	0.400	2.08	ND	ND		2	WG1176996
Bromodichloromethane	75-27-4	164	0.400	2.68	ND	ND		2	WG1176996
Bromoform	75-25-2	253	1.20	12.4	ND	ND		2	WG1176996
Bromomethane	74-83-9	94.90	0.400	1.55	ND	ND		2	WG1176996
1,3-Butadiene	106-99-0	54.10	4.00	8.85	ND	ND		2	WG1176996
Carbon disulfide	75-15-0	76.10	0.400	1.24	0.999	3.11		2	WG1176996
Carbon tetrachloride	56-23-5	154	0.400	2.52	ND	ND		2	WG1176996
Chlorobenzene	108-90-7	113	0.400	1.85	ND	ND		2	WG1176996
Chloroethane	75-00-3	64.50	0.400	1.06	ND	ND		2	WG1176996
Chloroform	67-66-3	119	0.400	1.95	ND	ND		2	WG1176996
Chloromethane	74-87-3	50.50	0.400	0.826	ND	ND		2	WG1176996
2-Chlorotoluene	95-49-8	126	0.400	2.06	ND	ND		2	WG1176996
Cyclohexane	110-82-7	84.20	0.400	1.38	0.603	2.08		2	WG1176996
Dibromochloromethane	124-48-1	208	0.400	3.40	ND	ND		2	WG1176996
1,2-Dibromoethane	106-93-4	188	0.400	3.08	ND	ND		2	WG1176996
1,2-Dichlorobenzene	95-50-1	147	0.400	2.40	ND	ND		2	WG1176996
1,3-Dichlorobenzene	541-73-1	147	0.400	2.40	ND	ND		2	WG1176996
1,4-Dichlorobenzene	106-46-7	147	0.400	2.40	ND	ND		2	WG1176996
1,2-Dichloroethane	107-06-2	99	0.400	1.62	ND	ND		2	WG1176996
1,1-Dichloroethane	75-34-3	98	0.400	1.60	ND	ND		2	WG1176996
1,1-Dichloroethene	75-35-4	96.90	0.400	1.59	ND	ND		2	WG1176996
cis-1,2-Dichloroethene	156-59-2	96.90	0.400	1.59	ND	ND		2	WG1176996
trans-1,2-Dichloroethene	156-60-5	96.90	0.400	1.59	ND	ND		2	WG1176996
1,2-Dichloropropane	78-87-5	113	0.400	1.85	ND	ND		2	WG1176996
cis-1,3-Dichloropropene	10061-01-5	111	0.400	1.82	ND	ND		2	WG1176996
trans-1,3-Dichloropropene	10061-02-6	111	0.400	1.82	ND	ND		2	WG1176996
1,4-Dioxane	123-91-1	88.10	0.400	1.44	ND	ND		2	WG1176996
Ethanol	64-17-5	46.10	1.26	2.38	5.29	9.97		2	WG1176996
Ethylbenzene	100-41-4	106	0.400	1.73	10.1	43.8		2	WG1176996
4-Ethyltoluene	622-96-8	120	0.400	1.96	2.78	13.6		2	WG1176996
Trichlorofluoromethane	75-69-4	137.40	0.400	2.25	0.864	4.85		2	WG1176996
Dichlorodifluoromethane	75-71-8	120.92	0.400	1.98	0.405	2.00		2	WG1176996
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.400	3.07	ND	ND		2	WG1176996
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.400	2.80	ND	ND		2	WG1176996
Heptane	142-82-5	100	0.400	1.64	2.07	8.48		2	WG1176996
Hexachloro-1,3-butadiene	87-68-3	261	1.26	13.5	ND	ND		2	WG1176996
n-Hexane	110-54-3	86.20	0.400	1.41	1.65	5.83		2	WG1176996
Isopropylbenzene	98-82-8	120.20	0.400	1.97	0.488	2.40		2	WG1176996
Methylene Chloride	75-09-2	84.90	0.400	1.39	ND	ND		2	WG1176996
Methyl Butyl Ketone	591-78-6	100	2.50	10.2	ND	ND		2	WG1176996
2-Butanone (MEK)	78-93-3	72.10	2.50	7.37	ND	ND		2	WG1176996
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	2.50	10.2	ND	ND		2	WG1176996
Methyl methacrylate	80-62-6	100.12	0.400	1.64	ND	ND		2	WG1176996
MTBE	1634-04-4	88.10	0.400	1.44	ND	ND		2	WG1176996
Naphthalene	91-20-3	128	1.26	6.60	ND	ND		2	WG1176996
2-Propanol	67-63-0	60.10	2.50	6.15	ND	ND		2	WG1176996
Propene	115-07-1	42.10	0.800	1.38	0.896	1.54	B	2	WG1176996

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Styrene	100-42-5	104	0.400	1.70	ND	ND		2	WG1176996
1,1,2,2-Tetrachloroethane	79-34-5	168	0.400	2.75	ND	ND		2	WG1176996
Tetrachloroethylene	127-18-4	166	0.400	2.72	0.960	6.51		2	WG1176996
Tetrahydrofuran	109-99-9	72.10	0.400	1.18	ND	ND		2	WG1176996
Toluene	108-88-3	92.10	0.400	1.51	31.0	117		2	WG1176996
1,2,4-Trichlorobenzene	120-82-1	181	1.26	9.33	ND	ND		2	WG1176996
1,1,1-Trichloroethane	71-55-6	133	0.400	2.18	ND	ND		2	WG1176996
1,1,2-Trichloroethane	79-00-5	133	0.400	2.18	ND	ND		2	WG1176996
Trichloroethylene	79-01-6	131	0.400	2.14	ND	ND		2	WG1176996
1,2,4-Trimethylbenzene	95-63-6	120	0.400	1.96	7.76	38.1		2	WG1176996
1,3,5-Trimethylbenzene	108-67-8	120	0.400	1.96	2.93	14.4		2	WG1176996
2,2,4-Trimethylpentane	540-84-1	114.22	0.400	1.87	ND	ND		2	WG1176996
Vinyl chloride	75-01-4	62.50	0.400	1.02	ND	ND		2	WG1176996
Vinyl Bromide	593-60-2	106.95	0.400	1.75	ND	ND		2	WG1176996
Vinyl acetate	108-05-4	86.10	0.400	1.41	ND	ND		2	WG1176996
m&p-Xylene	1330-20-7	106	0.800	3.47	40.0	173		2	WG1176996
o-Xylene	95-47-6	106	0.400	1.73	12.4	53.9		2	WG1176996
TPH (GC/MS) Low Fraction	8006-61-9	101	100	413	606	2500		2	WG1176996
(S) 1,4-Bromofluorobenzene	*460-00-4*	*175*	*60.0-140*		*98.5*				WG1176996

Method Blank (MB)

(MB) R3349571-3 10/09/18 14:06

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Helium	U		0.0259	0.100

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3349571-1 10/09/18 13:43 • (LCSD) R3349571-2 10/09/18 13:54

Analyte	Spike Amount %	LCS Result %	LCSD Result %	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Helium	2.50	2.71	2.61	108	104	70.0-130			3.67	25

Method Blank (MB)

(MB) R3348279-3 10/06/18 10:39

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.0569	1.25
Allyl Chloride	U		0.0546	0.200
Benzene	U		0.0460	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0436	0.200
Bromoform	U		0.0786	0.600
Bromomethane	U		0.0609	0.200
1,3-Butadiene	U		0.0563	2.00
Carbon disulfide	U		0.0544	0.200
Carbon tetrachloride	U		0.0585	0.200
Chlorobenzene	U		0.0601	0.200
Chloroethane	U		0.0489	0.200
Chloroform	U		0.0574	0.200
Chloromethane	U		0.0544	0.200
2-Chlorotoluene	U		0.0605	0.200
Cyclohexane	U		0.0534	0.200
Dibromochloromethane	U		0.0494	0.200
1,2-Dibromoethane	U		0.0185	0.200
1,2-Dichlorobenzene	U		0.0603	0.200
1,3-Dichlorobenzene	U		0.0597	0.200
1,4-Dichlorobenzene	U		0.0557	0.200
1,2-Dichloroethane	U		0.0616	0.200
1,1-Dichloroethane	U		0.0514	0.200
1,1-Dichloroethene	U		0.0490	0.200
cis-1,2-Dichloroethene	U		0.0389	0.200
trans-1,2-Dichloroethene	U		0.0464	0.200
1,2-Dichloropropane	U		0.0599	0.200
cis-1,3-Dichloropropene	U		0.0588	0.200
trans-1,3-Dichloropropene	U		0.0435	0.200
1,4-Dioxane	U		0.0554	0.200
Ethylbenzene	U		0.0506	0.200
4-Ethyltoluene	U		0.0666	0.200
Trichlorofluoromethane	U		0.0673	0.200
Dichlorodifluoromethane	U		0.0601	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0687	0.200
1,2-Dichlorotetrafluoroethane	U		0.0458	0.200
Heptane	U		0.0626	0.200
Hexachloro-1,3-butadiene	U		0.0656	0.630
n-Hexane	U		0.0457	0.200
Isopropylbenzene	U		0.0563	0.200

Method Blank (MB)

(MB) R3348279-3 10/06/18 10:39

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Methylene Chloride	0.0711	J	0.0465	0.200
Methyl Butyl Ketone	U		0.0682	1.25
2-Butanone (MEK)	U		0.0493	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0650	1.25
Methyl Methacrylate	U		0.0773	0.200
MTBE	U		0.0505	0.200
Naphthalene	U		0.154	0.630
2-Propanol	U		0.0882	1.25
Propene	0.113	J	0.0932	0.400
Styrene	U		0.0465	0.200
1,1,2,2-Tetrachloroethane	U		0.0576	0.200
Tetrachloroethylene	U		0.0497	0.200
Tetrahydrofuran	U		0.0508	0.200
Toluene	U		0.0499	0.200
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0665	0.200
1,1,2-Trichloroethane	U		0.0287	0.200
Trichloroethylene	U		0.0545	0.200
1,2,4-Trimethylbenzene	U		0.0483	0.200
1,3,5-Trimethylbenzene	U		0.0631	0.200
2,2,4-Trimethylpentane	U		0.0456	0.200
Vinyl chloride	U		0.0457	0.200
Vinyl Bromide	U		0.0727	0.200
Vinyl acetate	U		0.0639	0.200
m&p-Xylene	U		0.0946	0.400
o-Xylene	U		0.0633	0.200
Ethanol	U		0.0832	0.630
TPH (GC/MS) Low Fraction	U		6.91	50.0
(S) 1,4-Bromofluorobenzene	*87.4*			*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3348279-1 10/06/18 09:10 • (LCSD) R3348279-2 10/06/18 09:54

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.32	2.85	88.4	75.9	55.0-148			15.2	25
Propene	3.75	4.41	4.05	118	108	64.0-144			8.58	25
Dichlorodifluoromethane	3.75	4.47	4.08	119	109	64.0-139			9.23	25
1,2-Dichlorotetrafluoroethane	3.75	4.35	4.10	116	109	70.0-130			6.00	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3348279-1 10/06/18 09:10 • (LCSD) R3348279-2 10/06/18 09:54

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloromethane	3.75	4.01	4.04	107	108	70.0-130			0.854	25
Vinyl chloride	3.75	4.21	4.12	112	110	70.0-130			2.10	25
1,3-Butadiene	3.75	4.19	4.17	112	111	70.0-130			0.374	25
Bromomethane	3.75	4.12	3.96	110	106	70.0-130			4.04	25
Chloroethane	3.75	4.11	4.00	109	107	70.0-130			2.54	25
Trichlorofluoromethane	3.75	4.08	4.08	109	109	70.0-130			0.182	25
1,1,2-Trichlorotrifluoroethane	3.75	4.08	4.05	109	108	70.0-130			0.803	25
1,1-Dichloroethene	3.75	4.09	4.03	109	108	70.0-130			1.45	25
1,1-Dichloroethane	3.75	4.11	4.10	110	109	70.0-130			0.250	25
Acetone	3.75	3.77	3.68	101	98.0	70.0-130			2.62	25
2-Propanol	3.75	4.38	4.11	117	110	70.0-139			6.20	25
Carbon disulfide	3.75	3.97	3.90	106	104	70.0-130			1.60	25
Methylene Chloride	3.75	3.86	3.85	103	103	70.0-130			0.254	25
MTBE	3.75	4.09	4.06	109	108	70.0-130			0.691	25
trans-1,2-Dichloroethene	3.75	4.18	4.19	111	112	70.0-130			0.320	25
n-Hexane	3.75	4.00	3.99	107	106	70.0-130			0.389	25
Vinyl acetate	3.75	4.47	4.28	119	114	70.0-130			4.47	25
Methyl Ethyl Ketone	3.75	4.42	4.26	118	114	70.0-130			3.66	25
cis-1,2-Dichloroethene	3.75	4.25	4.17	113	111	70.0-130			1.87	25
Chloroform	3.75	4.14	4.13	110	110	70.0-130			0.235	25
Cyclohexane	3.75	4.04	4.02	108	107	70.0-130			0.543	25
1,1,1-Trichloroethane	3.75	4.12	4.05	110	108	70.0-130			1.70	25
Carbon tetrachloride	3.75	4.03	3.99	107	106	70.0-130			0.855	25
Benzene	3.75	4.13	4.11	110	110	70.0-130			0.655	25
1,2-Dichloroethane	3.75	4.25	4.22	113	113	70.0-130			0.699	25
Heptane	3.75	4.13	4.02	110	107	70.0-130			2.82	25
Trichloroethylene	3.75	4.14	4.04	110	108	70.0-130			2.27	25
1,2-Dichloropropane	3.75	4.14	4.06	110	108	70.0-130			1.93	25
1,4-Dioxane	3.75	4.24	4.17	113	111	70.0-140			1.71	25
Bromodichloromethane	3.75	4.22	4.13	112	110	70.0-130			1.97	25
cis-1,3-Dichloropropene	3.75	4.28	4.24	114	113	70.0-130			0.903	25
4-Methyl-2-pentanone (MIBK)	3.75	4.28	4.22	114	112	70.0-139			1.50	25
Toluene	3.75	4.25	4.16	113	111	70.0-130			2.06	25
trans-1,3-Dichloropropene	3.75	4.21	4.21	112	112	70.0-130			0.0230	25
1,1,2-Trichloroethane	3.75	4.34	4.25	116	113	70.0-130			2.04	25
Tetrachloroethylene	3.75	4.27	4.22	114	113	70.0-130			1.23	25
Methyl Butyl Ketone	3.75	4.63	4.51	123	120	70.0-149			2.56	25
Dibromochloromethane	3.75	4.21	4.24	112	113	70.0-130			0.685	25
1,2-Dibromoethane	3.75	4.32	4.32	115	115	70.0-130			0.163	25
Chlorobenzene	3.75	4.39	4.30	117	115	70.0-130			2.08	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3348279-1 10/06/18 09:10 • (LCSD) R3348279-2 10/06/18 09:54

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylbenzene	3.75	4.18	4.12	111	110	70.0-130			1.24	25
m&p-Xylene	7.50	8.25	8.14	110	109	70.0-130			1.42	25
o-Xylene	3.75	4.08	4.05	109	108	70.0-130			0.696	25
Styrene	3.75	4.20	4.15	112	111	70.0-130			1.21	25
Bromoform	3.75	4.10	4.08	109	109	70.0-130			0.439	25
1,1,2,2-Tetrachloroethane	3.75	4.22	4.21	112	112	70.0-130			0.272	25
4-Ethyltoluene	3.75	4.18	4.13	111	110	70.0-130			1.22	25
1,3,5-Trimethylbenzene	3.75	4.11	4.06	110	108	70.0-130			1.23	25
1,2,4-Trimethylbenzene	3.75	4.14	4.03	110	107	70.0-130			2.79	25
1,3-Dichlorobenzene	3.75	4.30	4.22	115	113	70.0-130			1.90	25
1,4-Dichlorobenzene	3.75	4.55	4.46	121	119	70.0-130			2.03	25
Benzyl Chloride	3.75	4.48	4.41	120	118	70.0-152			1.59	25
1,2-Dichlorobenzene	3.75	4.16	4.14	111	110	70.0-130			0.603	25
1,2,4-Trichlorobenzene	3.75	4.55	4.54	121	121	70.0-160			0.0753	25
Hexachloro-1,3-butadiene	3.75	4.12	4.02	110	107	70.0-151			2.47	25
Naphthalene	3.75	4.70	4.79	125	128	70.0-159			1.80	25
TPH (GC/MS) Low Fraction	203	219	216	108	106	70.0-130			1.73	25
Allyl Chloride	3.75	4.28	4.23	114	113	70.0-130			1.25	25
2-Chlorotoluene	3.75	4.21	4.09	112	109	70.0-130			2.97	25
Methyl Methacrylate	3.75	4.35	4.20	116	112	70.0-130			3.57	25
Tetrahydrofuran	3.75	4.09	4.09	109	109	70.0-137			0.0701	25
2,2,4-Trimethylpentane	3.75	4.05	4.08	108	109	70.0-130			0.679	25
Vinyl Bromide	3.75	4.03	4.00	107	107	70.0-130			0.577	25
Isopropylbenzene	3.75	4.11	4.01	110	107	70.0-130			2.53	25
(S) 1,4-Bromofluorobenzene				*101*	*98.1*	*60.0-140*				

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

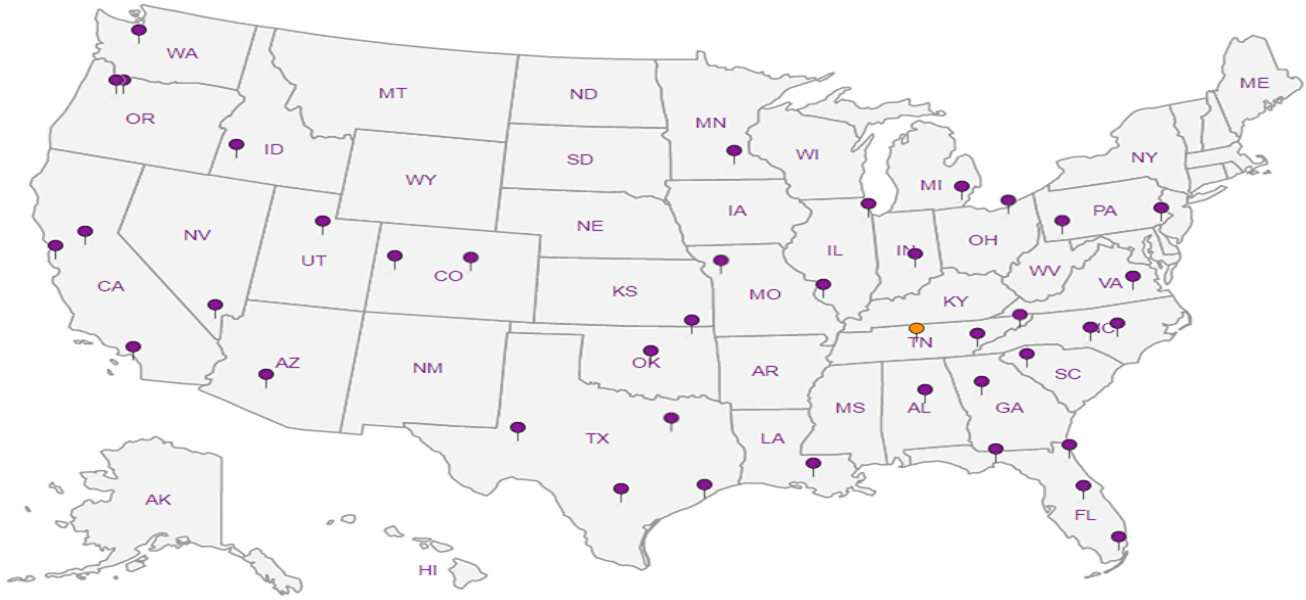
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



GES, Inc. - Concord, CA

5046 Commercial Circle, Ste. F
Concord, CA 94520

Billing Information:
GES Accounts Payable
440 Creamery Way
Ste. 500
Exton, PA 19341

Report to: Mark Peterson

Email To: mpeterson@gesonline.com; mwaters@gesonline.com

Project Description:

City/State Collected:

Phone: 866-507-1411
Fax: 925-825-2021

Client Project # 3016004-800008-206

Lab Project # GESCCA-ANCHORAGE

Collected by (print): Amy Zablocki

Site/Facility ID # 1035 GAMBELL ST.

P.O. #

Collected by (signature): [signature]

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TO-15, Helium Summa									Remarks	Sample # (lab only)
SV-1		Air		10/3/18	1025	1	X										01
~~SV-2~~		~~Air~~				~~1~~	~~X~~										
~~SV-3~~		~~Air~~				~~1~~	~~X~~										
		Air				1	X										

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1037495

M168

Acctnum: GESCCA
Template: T135053
Prelogin: P673261
TSR: 110 - Brian Ford
PB: BF 9/20/18
Shipped Via: FedEX 2nd Day

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: (4)1Liter summas, (4)200cc/min manifolds, (4)tubing and fittings

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
[signature]	10/3/18	1900	FedEx		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: Amb °C Bottles Received: 1	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10/5/18 Time: 0895	Hold: Condition: NCF / OK

APPENDIX D

DEC Laboratory Data Review Checklists

MEMORANDUM

TO: **Mark C. Peterson, Project Manager**
Amy Zablocki

FROM: **Bonnie Janowiak, Ph.D.**

RE: **Data Evaluation Narrative**
Shell 1035 Gambell St, Anchorage, AK
Groundwater and Environmental Services
Matrix: Groundwater – Sampled October 2018
Pace Analytical Laboratory SDG: L1031862 & L1032176

Review completed November 5, 2018

1. Data Review Criteria

Groundwater & Environmental Services, Inc. (GES) reviewed the analytical data from the Shell 1035 Gambell. Anchorage Alaska (site) October 2018 water sampling event in order to determine accuracy and precision for each analysis as well as to determine overall data usability. Organic data were reviewed for holding times, method and field blank results, surrogate or system monitoring compound recoveries, Matrix Spike/Matrix Spike Duplicate (MS/MSD) and LCS recoveries. All data necessary to complete the data review were provided by the laboratory.

Aqueous samples from six locations were collected from the site on October 1 through 3, 2018.

The analytical results were reviewed using laboratory acceptance criteria and procedures and guidelines contained in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, revised June 2008.

The samples were sent to Pace Analytical Laboratories and analyzed by the following methodologies:

- Volatile Organic Compounds (GC/MS) by Method 8260B,
- Semi-Volatile Organic Compounds (GC) by Method AK102/103,
- Semi Volatile Organic Compounds (GC/MS) by Method 8270 D-SIM,
- Volatile Organic Compounds (GC) by Method 8021/AK101.

2. Data Qualifiers Assigned

Table 1. Qualified Analytical Data

Field Identification	Analyte	Qualification	Reason for Qualification
All samples	AK103 RRO C25-C36	J/UJ	Low surrogate recovery
MW-9 DUP-1	Multiple (see Table 2)	J	RPD>30%
MW-6	SVOCs	J+	High surrogate recovery

J-/UJ- = Estimated with a possible low bias
J = Estimated value
J+: Estimated with a possible high bias

3. Data Quality

Data was overall of good quality and usable. There were no reported analytical issues. All quality control/quality assurance requirements were met.

3.1. Holding Times

All analyses were run within holding time.

3.2. Blank Results

There were no analytes reported above the reporting limit (RL) in the method blanks. There were analytes reported above the reporting limit (RL) in the trip blanks and equipment blank, but all associated data was non-detect, and the blank did not affect the data.

3.3. Laboratory Control Spike

All laboratory control spike recoveries were within laboratory-specified criteria.

3.4. Matrix Spike/

All laboratory control spike recoveries were within laboratory-specified criteria.

3.5. Preservation

Samples were collected and subsequently stored in amber sample bottles and stored at 4°C ± 2°C until prepared and analyzed. The temperature of the samples upon receipt by the laboratory was recorded within the acceptable range 2.5°C and 4.5°C. Samples were stored in appropriate bottleware with correct preservation until prepared and analyzed.

3.6. Surrogates Recoveries and Accuracy

The surrogate associated with AK103 RRO C25-C36 recovered low in all the samples. The detected and non-detect results are qualified as an estimated with a possible low bias.

3.7. Accuracy

Accuracy is a measure of the closeness of an observed value to the “true” value, e.g., theoretical or reference value, or population mean. Accuracy includes a combination of random error and systematic error (bias) that result from sampling and analytical operations. Analytical batch accuracy is measured through the analyses of recoveries in LCSs and MS/MSDs. Sample specific accuracy is measured with surrogate recovery. All surrogate recoveries and all recoveries reported in the LCS, and MS/MSD pair were within laboratory-specified criteria. Accuracy for this sampling event and report is 99%.

3.8. Sensitivity

Sensitivity is the measure of how low a concentration can be detected/reported. Sensitivity is measured using practical quantitation limits (PQLs) or reporting limits (RLs). Sensitivity is measured using PQLs or RLs with additional sensitivity achieved by reporting to the method detection limit (MDL). Analytes reported with a positive detection between the RL and the MDL are considered present, but the quantity is estimated. All analytes were reported with either the RL or MDL below the DEC clean-up levels.

3.9. Duplicate Analyses and Precision

A field duplicate (DUP-1) sample was collected and submitted blind to the laboratory for analysis. Table 2 contains the calculations and the qualifications that resulted from the precision analysis. Many of the RPDs are above accepted maximum values indicating imprecision in the sampling technique. Multiple analytical concentrations are impacted. Where the RPD exceeded maximum, data is qualified as estimated.

Precision is the distribution of a set of reported values about the mean, or the closeness of agreement between individual test results obtained under prescribed and similar conditions. Precision is best expressed in terms of RPD.

Analysis of the laboratory precision employed evaluation of laboratory spike/laboratory spike duplicate (LCS/LCSD) and matrix spike/matrix spike duplicates (MS/MSD) relative percent difference (RPD) precision calculations. The calculations returned all RPD values within laboratory provided ranges, with the exceptions listed above.

Table 2. Field Duplicate Precision

Field Identification	Analyte	Sample Result	Duplicate Result	RPD[1]	Qualified
MW-9 DUP-1	TPHGAK C6 to C10	574	402	-35.2	J
	n-Butylbenzene	6.31	6.90	8.9	A
	Ethylbenzene	8.68	0.417	-181.7	J
	Isopropylbenzene	12.0	0.390	-187.4	J
	p-Isopropyl toluene	11.6	9.29	-22.1	A
	Naphthalene	34.4	22.0	-44.0	J
	n-Propylbenzene	41.5	1.01	-190.5	J
	1,2,4-Trimethylbenzene	279	167	-50.2	J
	1,2,3-Trimethylbenzene	49.8	48.8	-2.0	A
	1,3,5-Trimethylbenzene	74.6	75.9	1.7	A
	Xylenes, Total	28.7	21.4	-29.1	J
	AK102 DRO C10-C25	2660	2820	5.8	A
	AK103 RRO C25-C36	484	526	8.3	A
	Anthracene	0.0113	0.00992	-13.0	A
	Acenaphthene	0.578	0.462	-22.3	A
	Fluorene	0.420	0.279	-40.3	J
	Naphthalene	19.3	6.45	-99.8	J
	1-Methylnaphthalene	20.6	8.29	-85.2	J

[1] Relative percent difference = |((SR-DR)*200)/(SR+DR)|

RPD = relative percent difference (RPD ≤ 30% is considered acceptable)

A - Acceptable data

mg/L = milligrams per liter

4. Summary

Groundwater analytical data are usable and considered definitive data and suitable for comparison to regulatory standards, with the exceptions of analytes listed in Table 1. Concentrations for this analyte in the above samples should be considered estimated.

Please do not hesitate to contact me if you have comments or questions.

Sincerely,

Bonnie Janowiak, Ph.D.
Senior Chemist
708 N Main St, Suite 201
Blacksburg, VA 24060

Laboratory Data Review Checklist

Completed by:	Bonnie Janowiak		
Title:	Project Chemist	Date:	Nov 1, 2018
CS Report Name:	Q4 Semi-Annual 2018 Groundwater Monitoring and PAH Sampling Report	Report Date:	Oct 16, 2018
Consultant Firm:	Groundwater & Environmental Services		
Laboratory Name:	Pace Analytical	Laboratory Report Number:	L1031862/L1032176
ADEC File Number:	2100.26.098	ADEC RecKey Number:	1989210025502

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (●) NA (Please explain) Comments:

No transfer of samples.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Samples were received at 2.7°C and 4.4°C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

All samples present, intact, and properly preserved.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

( ) Yes (●) No ( ) NA (Please explain) Comments:

The laboratory does not have a sample specific case narrative. The laboratory provides a liability statement indicating that all data has been reviewed and all issues have been identified.

e. Data quality or usability affected? (Please explain)

Comments:

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

The laboratory does not have a sample specific case narrative. The laboratory provides a liability statement indicating that all data has been reviewed and all issues have been identified.

b. Discrepancies, errors or QC failures identified by the lab?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. Were all corrective actions documented?

( ) Yes ( ) No (●) NA (Please explain) Comments:

see a.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

( ) Yes ( ) No (●) NA (Please explain) Comments:

There were no soil samples submitted to the laboratory.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

e. Data quality or usability affected? (Please explain)

Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

( ) Yes (●) No ( ) NA (Please explain) Comments:

1,2,3-Trichlorobenzene reported 0.304 ug/L in the method blank.

iii. If above PQL, what samples are affected? Comments:

No samples are affected.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

v. Data quality or usability affected? (Please explain) Comments:

All samples with positive detections of 1,2,3-trichlorobenzene have concentrations that exceed the EPA guidance of 5x the blank concentration to be considered representative of the sampling location.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

○ Yes ○ No ◉ NA (Please explain) Comments:

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

%R/RPD within limits.

vii. Data quality or usability affected? (Please explain) Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

○ Yes ◉ No ○ NA (Please explain) Comments:

Surrogate n-triacontane for RRO analysis recovered belowthe laboratory limits in all samples. p-Terphenyl-D4 recovered high in MW-6. PAHs have a possible high bias.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

RRO is qualified as estimated low in all samples. Positive PAH concentration in MW-6 are qualified as estimated with a possible high bias.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ◉ No ○ NA (Please explain) Comments:

Many of the RPDs are above accepted maximum values indicating imprecision in the sampling technique.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

◉ Yes ○ No ◉ NA (Please explain) Comments:

Multiple analytical concentrations are impacted. Where the RPD exceeded maximum, data is qualified as estimated.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Reset Form

MEMORANDUM

TO: **Mark C. Peterson, Project Manager**
Amy Zablocki

FROM: **Bonnie Janowiak, Ph.D.**

RE: **Data Evaluation Narrative**
Project: Shell-1035 Gambell St, Anchorage, AK
Groundwater and Environmental Services
Matrix: Air –Sampled October 3, 2018
Pace Analytical Laboratories Number: L1032095

Review completed November 6, 2018

1. Data Review Criteria

Groundwater & Environmental Services, Inc. (GES) reviewed the analytical data from the **Shell-1035 Gambell St, Anchorage, AK** (site) October 2018 air sampling event in order to determine accuracy and precision for each analysis as well as to determine overall data usability.

An air sample from one location was collected from the site. The sample was sent to Pace Analytical Laboratories and analyzed by the following methodology as requested on the Chain of Custody:

- Volatile Organic Compounds (MS) by Method TO-15

The analytical results were validated using laboratory acceptance criteria, procedures and guidelines contained in the following documents: The United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines (NFG) for Organic and Inorganic Data Review (USEPA 2017 and 2016). Also referenced for procedures were the analytical EPA Method TO-15. Because there is no USEPA guidance for data validation specifically for vapor sampling, to further insure best practices the guidance published by ALS Environmental Laboratories compiled by Trihydro Corporation and Columbia Analytical Services specifically for vapor samples was also referenced. Items reviewed were sample dilutions, initial and continuing calibration, instrument performance checks, internal standards, system monitoring compounds, method blanks and equipment blanks, duplicate analyses, and oxygen percentages. Results were qualified as estimated detected ("J"), estimated high ("J+"), estimated low ("J-"), estimated non-detected ("UJ"), non-detect ("U"), or rejected/unusable ("R"), based on the guidelines referenced above.

2. Data Qualifiers Assigned

No data was qualified due to compliance issues. Data is considered usable as reported.

3. Data Quality

Data was overall of good quality and usable. There were no reported analytical issues. All laboratory quality control/quality assurance requirements were met, unless noted below.

3.1. Blank Results

` There were no analytes reported above the reporting limit (RL) that had positive detections in the samples: Below RL but above method detection limit concentrations were reported for propene and methylene chloride. Although detected in the blank, the sample reported propene in concentrations higher than the recommended 5x blank result, and was non-detect for methylene chloride. All detections in the sample are considered representative of the sampling location. No qualifications were necessary.

3.2. Laboratory Control Spike

All laboratory control spike recoveries were within laboratory-specified criteria, with the exception of a low recovery for hexachlorobutadiene. The possible low bias qualifies all data for this analyte as estimated.

3.3. Preservation, Collection and Storage

Samples were collected appropriately and arrived at the laboratory at appropriate pressures to run the analyses without a dilution factor due to receipt issues.

3.4. Surrogates Recoveries and Accuracy

The surrogate recoveries were all within laboratory-specified ranges.

3.5. Duplicate Analyses and Precision

Precision is the distribution of a set of reported values about the mean, or the closeness of agreement between individual test results obtained under prescribed and similar conditions. Precision is best expressed in terms of relative percent difference (RPD).

Analysis of the laboratory precision employed evaluation of laboratory spike/laboratory spike duplicate (LCS/LCSD) relative percent difference (RPD) precision calculations. The calculations returned all RPD values within laboratory provided ranges.

3.6. Accuracy

Accuracy is a measure of the closeness of an observed value to the "true" value, e.g., theoretical or reference value, or population mean. Accuracy includes a combination of random error and systematic error (bias) that result from sampling and analytical operations. Analytical batch accuracy is measured through the analyses of recoveries in LCSs and MS/MSDs. Sample specific accuracy is measured with surrogate recovery. All surrogate recoveries and all recoveries reported in the LCS/LCSD pair were within laboratory-specified criteria, with the exception of the above noted Hexachlorobutadiene LCS recovery. Accuracy for this sampling event and report is 100%.

3.7. Sensitivity

Sensitivity is the measure of how low a concentration can be detected/reported. Sensitivity is measured using practical quantitation limits (PQLs) or reporting limits (RLs). RLs are lower than the commercial DEC shallow soil gas target levels with the exception of 1,2-dibromomethane.

4. Summary

Air analytical data are usable and considered definitive data and suitable for comparison to regulatory standards.

Please do not hesitate to contact me if you have comments or questions.

Sincerely,

Bonnie Janowiak, Ph.D.
Project Chemist
701 N Main St, Suite 201
Blacksburg, VA 24060

Laboratory Data Review Checklist

Completed by:	Bonnie Janowiak		
Title:	Project Chemist	Date:	Nov 6, 2018
CS Report Name:	Soil Vapor Sampling Event	Report Date:	Oct 11, 2018
Consultant Firm:	Groundwater & Environmental Services, Inc.		
Laboratory Name:	Pace Analytical	Laboratory Report Number:	L1032095
ADEC File Number:	2100.26.098	ADEC RecKey Number:	1989210025502

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(●) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (●) NA (Please explain) Comments:

No samples were transferred or subcontracted.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

( ) Yes ( ) No (●) NA (Please explain) Comments:

Samples were collected appropriately and arrived at the laboratory at appropriate pressures to run the analyses without a dilution factor due to receipt issues.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

○ Yes ○ No ◉ NA (Please explain) Comments:

Air samples - no preservation.

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain) Comments:

All samples present and intact.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

○ Yes ○ No ◉ NA (Please explain) Comments:

No discrepancies noted in the check-in paperwork.

e. Data quality or usability affected? (Please explain)

Comments:

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No ○ NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain) Comments:

No discrepancies or failures noted.

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain) Comments:

No corrective actions needed

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The data is usable.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

( ) Yes ( ) No (●) NA (Please explain) Comments:

Air samples only.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

( ) Yes (●) No ( ) NA (Please explain) Comments:

RLs are lower than the commercial DEC shallow soil gas target levels with the exception of 1,2-dibromoethane.

e. Data quality or usability affected? (Please explain)

Comments:

No.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Below RL but above method detection limit concentrations were reported for propene and methylene chloride.

iii. If above PQL, what samples are affected? Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Propene was qualified "B" by the laboratory. Methylene chloride was non-detect in the sample, and is not impacted by the positive blank detection.

v. Data quality or usability affected? (Please explain) Comments:

Although detected in the blank, the sample reported propene in concentrations higher than the recommended 5x blank result, and was non-detect for methylene chloride.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

( ) Yes ( ) No (●) NA (Please explain) Comments:

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No ( ) NA (Please explain) Comments:

All data associated with the site is reported within method or laboratory limits.

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

(●) Yes ( ) No ( ) NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

vii. Data quality or usability affected? (Please explain) Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

(●) Yes ( ) No ( ) NA (Please explain) Comments:

All recoveries associated with the site locations are reported within method or laboratory limits.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

( ) Yes ( ) No (●) NA (Please explain) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.). Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

( ) Yes ( ) No (●) NA (Please explain.) Comments:

Only air samples collected.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

( ) Yes ( ) No (●) NA (Please explain.) Comments:

No trip blank required. Only air samples collected.

iii. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No trip blank required.

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

○ Yes ◉ No ○ NA (Please explain) Comments:

No field duplicate.

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain) Comments:

No field duplicate.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain) Comments:

No field duplicate.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ◉ No ○ NA (Please explain) Comments:

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

No equipment blank in the analytical batch.

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Reset Form