

September 22, 2020

Ms. Becky Roth
P.O. Box 221649
Anchorage, Alaska 99522

RE: GROUNDWATER SAMPLING, 1090 WEST DIMOND BOULEVARD, ANCHORAGE,
ALASKA; ADEC FILE NO. 2100.26.222

Dear Ms. Roth:

This report presents the results of Shannon & Wilson's August 2020 groundwater sampling activities conducted at 1090 West Dimond Boulevard, Anchorage, Alaska.

The groundwater sampling activities were conducted in general with our February 5, 2019 work plan, which was approved by Mr. Robert Weimer of the Alaska Department of Environmental Conservation (ADEC) on January 6, 2020, via email.

BACKGROUND

The property is listed on the ADEC Contaminated Sites database (File Number 2100.26.222) due to a gasoline release in 1990 from a former underground storage tank (UST) and associated distribution piping and dispensers. Following cleanup and assessment activities, the site was granted Cleanup Complete with Institutional Controls (CCIC) by the ADEC on February 27, 2019. However, to potentially achieve full site closure, a decision was made to continue sampling Well MW-7A to document benzene and naphthalene concentration trends. Groundwater samples were collected quarterly from the well during 2019. Benzene was detected in each sampling event at concentrations greater than the ADEC cleanup level. However, naphthalene was not detected at concentrations above the ADEC cleanup level. The approximate location of Monitoring Well MW-7A is shown on Figure 1.

FIELD ACTIVITIES

Project activities consisted of collecting a groundwater sample from Well MW-7A. Field notes are provided in Attachment 1.

Groundwater Sampling

Monitoring Well MW-7A was purged and sampled on August 25, 2020 using low-flow techniques to reduce the effects of stagnant well casing water on chemical concentrations

and to obtain a groundwater sample that is representative of the surrounding water-bearing formation. The well was purged and sampled with a submersible pump and disposable tubing. The pump inlet was set within the screened portion of the well. The pump level was adjusted as necessary to maintain pump rate. A pump rate ranging from 0.2 liter per minute (L/min) to 0.25 L/min was used with a goal of limiting the sustained water drawdown to a maximum of 0.1 meter (4 inches). During the sampling event, the pump level had to be adjusted to maintain the flow rate without purging dry. During the purging process, field personnel monitored water quality parameters (temperature, specific conductance, pH, dissolved oxygen, oxidation reduction potential, and turbidity), purge volume, and drawdown which were recorded at 3 to 5-minute intervals.

The groundwater sample was collected when the water quality parameters stabilized and three well volumes were removed. The well was allowed to recover to at least 80 percent of the pre-purge volume prior to sampling. Stabilization criteria composed three successive readings of: pH within 0.1-unit, temperature within 3 percent (minimum 0.2 degree Celsius), specific conductance within 3 percent, and turbidity within 10 percent or three consecutive readings of less than 10 nephelometric turbidity units (NTU). The final water quality parameters are listed on Table 1.

The analytical sample was collected by transferring water directly from the pump tubing into laboratory-supplied containers. The sample was placed into a chilled cooler for transport to the laboratory using chain-of-custody procedures. The purge water was contained in a 5-gallon bucket and stored onsite.

LABORATORY ANALYSES

The groundwater sample was submitted to SGS North America, Inc. (SGS) using chain-of-custody procedures on a standard two-week turnaround basis and analyzed for benzene and naphthalene by Environmental Protection Agency (EPA) Method 8260D. A trip blank sample accompanied the analytical sample containers from and to the laboratory and was tested for benzene and naphthalene by EPA Method 8260D. The laboratory report is provided in Attachment 2.

DISCUSSION OF RESULTS

The reported contaminant concentrations in the groundwater sample was compared to the cleanup levels listed in Table C of 18 Alaska Administrative Code (AAC) 75.345 (October 2018). The August 2020 sampling event and historical results are summarized in Table 2.

During the August 2020 sampling event, concentrations of benzene and naphthalene were not detected in the sample collected from MW-7A.

INVESTIGATION DERIVED WASTE

Investigation-derived waste (IDW) from this project consisted of one 5-gallon drum of purge water. Following receipt of the analytical results, the water was discharged to an unpaved portion of the Property.

SUMMARY

The groundwater sample collected from Monitoring Well MW-7A was used to monitor trends of dissolved phased benzene and naphthalene concentrations. Benzene and naphthalene were not detected during the August 2020 sampling event. Benzene concentrations have decreased over the last three sampling events and was not detected during the current sampling event. Naphthalene has not been detected during three of the last five sampling events.

CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives in the study of this site. The findings we have presented in this report are based on the limited sampling and analyses that we conducted. They should not be construed as a definite conclusion regarding the site's groundwater quality. As a result, the sampling and analyses performed is the basis for our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations for this site may need to be revised.

Shannon and Wilson has prepared the information in Attachment 3, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our reports.

We appreciate this opportunity to be of service. Please call the undersigned at 907-561-2120 with questions or comments concerning the contents of this report.

Sincerely,

SHANNON & WILSON



Jessa Tibbetts
Environmental Scientist

Enc. Tables 1 and 2; Figure 1; Attachments 1 through 3

**TABLE 1
WELL SAMPLING LOG**

	Monitoring Well Number
	MW-7A
Water Level Measurement Data	
Date Water Level Measured	8/25/2020
Time Water Level Measured	11:00
Measured Depth to Water (ft below TOC)	3.44
Sampling Data	
Date Sampled	8/25/2020
Time Sampled	12:35
Measured Depth to Water (ft below TOC)	3.44
Total Depth of Well (ft below TOC)	9.60
Well Screen Interval (ft below TOC)*	7-10.3
Water Column in Well (ft)	6.16
Gallons per Foot	0.16
Water Column Volume (gallons)	0.99
Total Volume Pumped (gallons)	3.3
Sampling Method	Submersible pump
Diameter of Well Casing	2-inch
Water Quality Data	
Temperature (°C)	15.17
pH (Standard Units)	7.83
Oxidation-Reduction Potential (mV)	202
Specific Conductivity (µS/cm)	130
Turbidity (NTU)	238.7
Remarks	

Notes:

Water quality parameters were measured with a Horiba water quality instrument and MicroTPW turbidimeter

TOC = Top of Casing

ft = Feet

°C = Degrees Celsius

µS/cm = Microsiemens per Centimeter

NTU = Nephelometric Turbidity Unit

mV = Millivolts

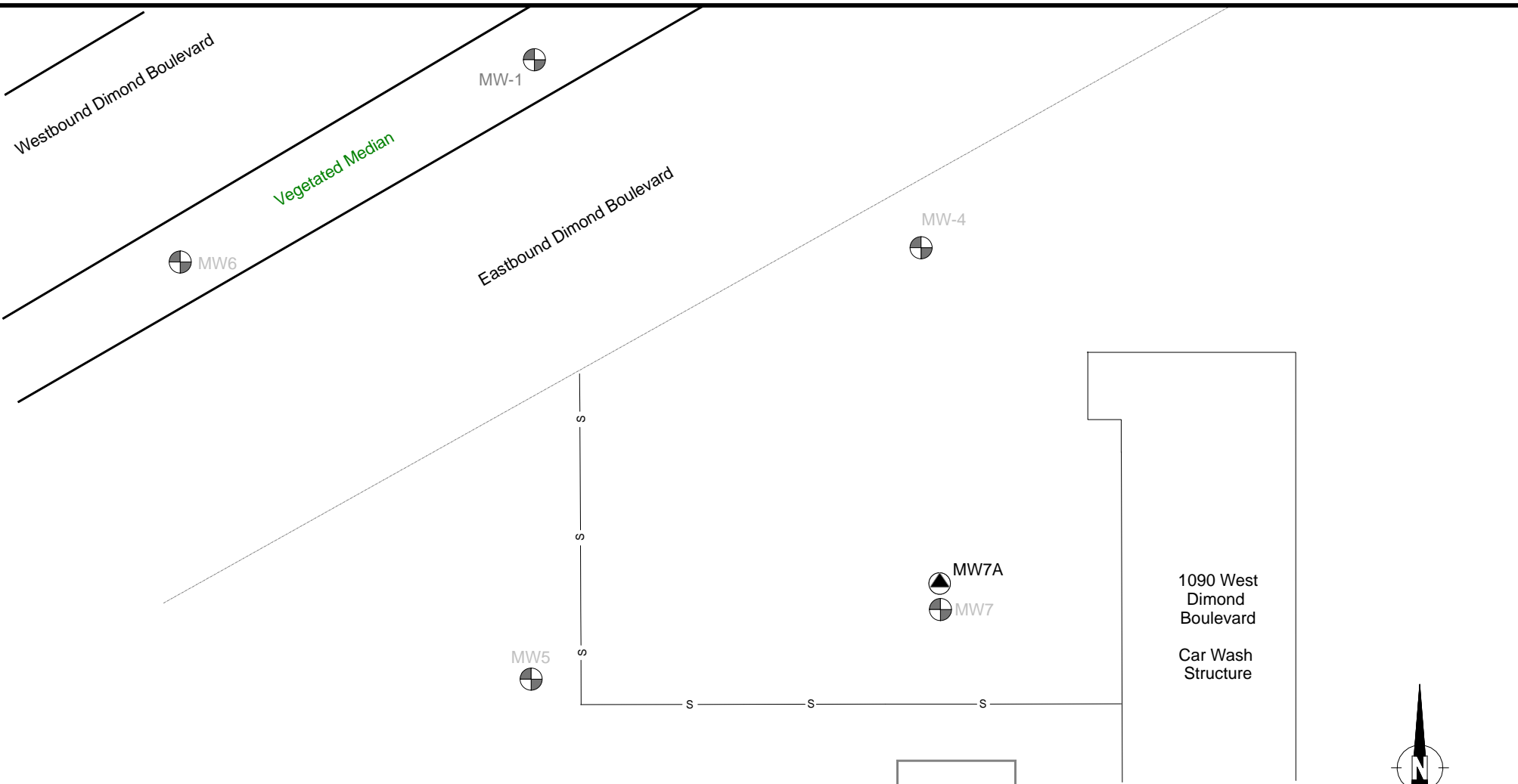
* = At the time of well installation

**TABLE 2
HISTORICAL GROUNDWATER DATA**



Monitoring Well	Date	Parameter Tested and Cleanup Level (milligrams per liter)						
		GRO 1.3	DRO 1.5	Benzene 0.0046	Toluene 1.1	Ethylbenzene 0.015	Xylenes 0.19	Naphthalene 0.0017
MW-1*	8/29/2014	<0.0500	-	<0.000250	<0.000500	<0.000500	<0.00150	-
	6/12/2015	<0.0500	<1.20	<0.000250	<0.000500	<0.000500	<0.00150	-
MW-2*	8/29/2014	Well not located; assumed lost						
MW-3*	8/29/2014	Well decommissioned						
MW-4	8/29/2014^	<0.0500	-	<0.000250	<0.000500	<0.000500	<0.00150	-
	6/27/2015^	0.0831 E, J	0.433 E, J	0.00217 E	0.00906 E	0.00172 E	0.0124 E	-
	3/31/2016^	<0.0500	0.959 E	0.000420 J	0.00116	<0.000500	<0.003 B	-
	7/6/2016	<0.0500	0.199 J	<0.000250	<0.000500	<0.000500	<0.00150	-
	9/30/2016	0.0355 J	0.211 J	<0.000250	<0.000500	<0.000500	<0.00150	-
	5/26/2017	-	-	<0.000200	<0.000500	<0.000500	<0.00150	-
MW-5	10/22/2015	<0.100 B	<0.288	<0.000250	<0.000500	<0.000500	<0.00150	-
	3/30/2016	<0.0500	0.306 J	<0.000250	<0.000500	<0.000500	<0.00150	-
	7/5/2016	<0.0500	<0.294	<0.000250	<0.000500	<0.000500	<0.00150	-
	9/30/2016	0.0330 J	<0.288	<0.000250	<0.000500	<0.000500	<0.00150	-
	5/26/2017	-	-	<0.000200	<0.000500	<0.000500	<0.00150	-
MW-6	10/22/2015	<0.0500	<0.588 B	<0.000250	<0.000500	<0.000500	<0.00150	-
	3/30/2016	<0.0500	0.208 J	<0.000250	<0.000500	<0.000500	<0.00150	-
	7/5/2016	<0.0500	<0.285	<0.000250	<0.000500	<0.000500	<0.00150	-
	9/30/2016	<0.0500	<0.300	<0.000250	<0.000500	<0.000500	<0.00150	-
	5/26/2017	-	-	<0.000200	<0.000500	<0.000500	<0.00150	-
MW-7	10/22/2015	<0.100 B	<0.588 B	0.00100	0.000960 J	<0.000500	0.000590 J	-
	3/31/2016	0.331	0.618	0.104	0.00407	0.00223	0.00520 B	-
	7/6/2016^	0.0395 J	0.297 J	0.00917 J+	<0.000500	<0.000500	<0.00150	-
	9/30/2016^	0.0311 J	0.322 J	0.0036	<0.000500	<0.000500	0.000350 J	-
	5/26/2017	-	-	0.00196	<0.000500	<0.000500	0.000910 J	-
	10/13/2017	-	-	0.00154	<0.000500	<0.000500	<0.00150	-
MW-7A	10/22/2015^	<0.100 B	<0.588 B	0.00247	0.00585	0.00123	0.0108	-
	3/30/2016	Not sampled due to ice plug at 3.31 feet below top of casing						
	7/6/2016	0.0445 J	0.0312 J	0.00906	<0.000500	<0.000500	<0.00150	-
	9/30/2016	0.0388 J	0.0352 J	0.00669	<0.000500	0.00042	<0.00150	-
	5/26/2017^	0.0399 J	<0.294	0.00255	0.000540 J	<0.000500	0.000730 J	-
	10/13/2017	-	-	0.0172	<0.000500	0.00035 J	<0.00150	-
	6/28/2018	-	-	0.0147	0.000720 J	0.00105	0.00126 J	-
	11/7/2018	-	-	0.0366	0.000490 J	0.00187	<0.00150	-
	2/16/2019	Not sampled due to ice plug at 3.64 feet below top of casing						
	4/2/2019	Not sampled due to ice plug at 3.40 feet below top of casing						
	5/13/2019	-	-	0.00881	-	-	-	0.000980 J
	7/11/2019	-	-	0.0409	-	-	-	<0.000500
	9/13/2019	-	-	0.0730	-	-	-	0.000360 J
11/13/2019	-	-	0.0203	-	-	-	<0.000500	
8/25/2020	-	-	<0.000200	-	-	-	<0.000500	

Notes:

- * = Analytical laboratory data for groundwater samples collected prior to 2014 is not available
- = Not applicable or sample not tested for this analyte
- <0.0500 = Analyte not detected; laboratory limit of detection of 0.0500 mg/L
- 0.331** = Analyte detected
- 0.104** = Analyte concentration exceeds ADEC cleanup level
- B = Reported concentration potentially affected by blank detection
- E = Result is an estimate due to primary/field duplicate pair relative percent difference (RPD) failure
- J = Estimated concentration less than the limit of quantitation
- J+ = Estimated concentration may be biased high. See the SGS laboratory report for more details
- ^ = Higher analytical result of the sample and duplicate

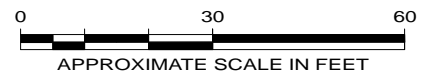
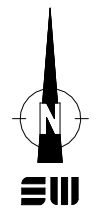



LEGEND

- 
 Approximate location of Monitoring Well MW-7A.
 MW7A
- 
 Approximate location of Monitoring Well MW7 decommissioned in October 2018.
 MW7

Concrete Pad
(former west
fuel dispenser
island #2)

Concrete Pad
(former west
fuel dispenser
island #3)



1090 West Dimond Boulevard Anchorage, Alaska	
SITE PLAN	
September 2020	102504-002
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	Fig. 1

ATTACHMENT 1
FIELD NOTES



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 102504 Location: 1090 West Diamond Weather: 56° rainy + cloudy
 Well No.: MW7
 Date: 8/25/2020 Time Started: 10:45 Time Completed: 12:57
 Develop Date: _____ Develop End Time: _____ (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 11:00 Date of Depth Measurement: 8/25/20
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
 Diameter of Casing: 2" Well Screen Interval: 7-11'
 Total Depth of Well Below MP: 9.6 Product Thickness, if noted: _____
 Depth-to-Water (DTW) Below MP: 3.44
 Water Column in Well: 6.16 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.99 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 8/25/20 Time Started: 11:26 Time Completed: 12:38
 Three Well Volumes: 2.97 (Gallons in Well x 3)
 Gallons Purged: 3.3 Depth of Pump (generally 2 ft from bottom): 6.5'
 Max. Drawdown (generally 0.3 ft): 0.1 Pump Rate: 0.2
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>11:30</u>	<u>0.15</u>	<u>0.2</u>	<u>3.54</u>	<u>0.1</u>	<u>14.75</u>	<u>69</u>	<u>8.19</u>	<u>7.68</u>	<u>207</u>	<u>239.3</u>
<u>11:35</u>	<u>0.5</u>	<u>0.25</u>	<u>3.54</u>	<u>0.1</u>	<u>14.82</u>	<u>77</u>	<u>8.01</u>	<u>7.76</u>	<u>203</u>	<u>279.3</u>
<u>11:40</u>	<u>0.75</u>	<u>0.2</u>	<u>3.54</u>	<u>0.1</u>	<u>14.91</u>	<u>88</u>	<u>7.73</u>	<u>7.83</u>	<u>200</u>	<u>295.6</u>
<u>11:45</u>	<u>1.0</u>	<u>0.2</u>	<u>3.50</u>	<u>0.06</u>	<u>15.03</u>	<u>99</u>	<u>7.47</u>	<u>7.86</u>	<u>201</u>	<u>269.5</u>
<u>11:50</u>	<u>1.25</u>	<u>0.2</u>	<u>3.52</u>	<u>0.08</u>	<u>15.14</u>	<u>113.0</u>	<u>7.18</u>	<u>7.83</u>	<u>203</u>	<u>262.0</u>
<u>11:55</u>	<u>1.50</u>	<u>0.2</u>	<u>3.52</u>	<u>0.08</u>	<u>15.17</u>	<u>130</u>	<u>6.93</u>	<u>7.83</u>	<u>202</u>	<u>238.7</u>

SAMPLING DATA

Odor: None Color: Clear w/ Tan tint
 Sample Designation: 102504-MW7 Time / Date: 12:35 8/25/20
 QC Sample Designation: _____ Time / Date: _____
 QA Sample Designation: _____ Time / Date: _____
 Evacuation Method: Submersible Pump / Other: Single Whisk
 Sampling Method: Submersible Pump / Other: " "
 Water Quality Instruments Used/Manufacturer/Model Number Horiba + Turbidimeter
 Calibration Info (Time, Ranges, etc) 11:00 8/25/20
 Remarks: _____

Sampling Personnel: ZST

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

ATTACHMENT 2
RESULTS OF ANALYTICAL TESTING BY
SGS NORTH AMERICA INC. OF ANCHORAGE, ALASKA AND ADEC
LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907)433-3223

Report Number: **1204499**

Client Project: **102504 Youngs Fire House**

Dear Dan McMahon,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1204499**
Project Name/Site: **102504 Youngs Fire House**
Project Contact: **Dan McMahon**

Refer to sample receipt form for information on sample condition.

LCSD for HBN 1811000 [VXX/3623 (1577870) LCSD

8260D - LCSD recovery for chloroethane does not meet QC criteria. This analyte was not reported above the LOQ in the associated samples.

8260D - LCS/LCSD RPDs for chloroethane and trichlorofluoromethane do not meet QC criteria. These analytes were not reported above the LOQ in the associated samples.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 08/31/2020 3:29:21PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
102504-MW7	1204499001	08/25/2020	08/25/2020	Water (Surface, Eff., Ground)
102504-WTB	1204499002	08/25/2020	08/25/2020	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
SW8260D	Volatile Organic Compounds(W)Custom List

Print Date: 08/31/2020 3:29:25PM



Results of **102504-MW7**

Client Sample ID: **102504-MW7**
Client Project ID: **102504 Youngs Fire House**
Lab Sample ID: 1204499001
Lab Project ID: 1204499

Collection Date: 08/25/20 12:35
Received Date: 08/25/20 14:21
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/28/20 21:39
Naphthalene	0.500 U	1.00	0.310	ug/L	1		08/28/20 21:39

Surrogates

1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		08/28/20 21:39
4-Bromofluorobenzene (surr)	108	85-114		%	1		08/28/20 21:39
Toluene-d8 (surr)	106	89-112		%	1		08/28/20 21:39

Batch Information

Analytical Batch: VMS20255
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 08/28/20 21:39
Container ID: 1204499001-A

Prep Batch: VXX36234
Prep Method: SW5030B
Prep Date/Time: 08/28/20 16:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 102504-WTB

Client Sample ID: **102504-WTB**
Client Project ID: **102504 Youngs Fire House**
Lab Sample ID: 1204499002
Lab Project ID: 1204499

Collection Date: 08/25/20 12:00
Received Date: 08/25/20 14:21
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		08/28/20 20:26
Naphthalene	0.500 U	1.00	0.310	ug/L	1		08/28/20 20:26
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		08/28/20 20:26
4-Bromofluorobenzene (surr)	108	85-114		%	1		08/28/20 20:26
Toluene-d8 (surr)	105	89-112		%	1		08/28/20 20:26

Batch Information

Analytical Batch: VMS20255
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 08/28/20 20:26
Container ID: 1204499002-A

Prep Batch: VXX36234
Prep Method: SW5030B
Prep Date/Time: 08/28/20 16:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1811000 [VXX/36234]
 Blank Lab ID: 1577868

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1204499001, 1204499002

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	81-118		%
4-Bromofluorobenzene (surr)	109	85-114		%
Toluene-d8 (surr)	104	89-112		%

Batch Information

Analytical Batch: VMS20255
 Analytical Method: SW8260D
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 8/28/2020 4:57:00PM

Prep Batch: VXX36234
 Prep Method: SW5030B
 Prep Date/Time: 8/28/2020 4:30:00PM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Leaching Blank

Blank ID: LB for HBN 1810886 [TCLP/10792]
 Blank Lab ID: 1577426

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1204499001, 1204499002

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	10.0U	20.0	6.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	102	81-118		%
4-Bromofluorobenzene (surr)	108	85-114		%
Toluene-d8 (surr)	105	89-112		%

Batch Information

Analytical Batch: VMS20255
 Analytical Method: SW8260D
 Instrument: Agilent 7890-75MS
 Analyst: NRB
 Analytical Date/Time: 8/28/2020 8:55:00PM

Prep Batch: VXX36234
 Prep Method: SW5030B
 Prep Date/Time: 8/28/2020 4:30:00PM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 08/31/2020 3:29:29PM



Leaching Blank

Blank ID: LB for HBN 1810948 [TCLP/10793]
Blank Lab ID: 1577660

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1204499001, 1204499002

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	10.0U	20.0	6.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	108	85-114		%
Toluene-d8 (surr)	104	89-112		%

Batch Information

Analytical Batch: VMS20255
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 8/28/2020 9:10:00PM

Prep Batch: VXX36234
Prep Method: SW5030B
Prep Date/Time: 8/28/2020 4:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/31/2020 3:29:29PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1204499 [VXX36234]
 Blank Spike Lab ID: 1577869
 Date Analyzed: 08/28/2020 17:15

Spike Duplicate ID: LCSD for HBN 1204499
 [VXX36234]
 Spike Duplicate Lab ID: 1577870
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1204499001, 1204499002

Results by SW8260D

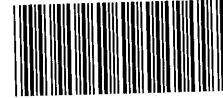
Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	32.6	109	30	32.1	107	(79-120)	1.60	(< 20)
Naphthalene	30	27.0	90	30	29.6	99	(61-128)	9.00	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	99.1	99	30	98.1	98	(81-118)	1.10	
4-Bromofluorobenzene (surr)	30	104	104	30	104	104	(85-114)	0.54	
Toluene-d8 (surr)	30	98.3	98	30	99.1	99	(89-112)	0.80	

Batch Information

Analytical Batch: **VMS20255**
 Analytical Method: **SW8260D**
 Instrument: **Agilent 7890-75MS**
 Analyst: **NRB**

Prep Batch: **VXX36234**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/28/2020 16:30**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

1204499



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
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(206) 632-8020

2355 Hill Road
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St. Louis, MO 63146-3564
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5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

CHAIN-OF-CUSTODY RECORD

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

Laboratory SGS Anchorage
Attn: Justin

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	Benzene, Naphthalene, PTA-8260D				Total Number of Containers	Remarks/Matrix
102504-MW7	(AE)	12:35	8/25/20			X				3	Water
102504-WTB	(JA)	12:00	8/25/20			X				1	Trip Blank

365300 210

Project Information	Sample Receipt
Project Number: <u>102504-</u>	Total Number of Containers
Project Name: <u>Youngs Fire House</u>	COC Seals/Intact? Y/N/NA
Contact: <u>Dan</u>	Received Good Cond./Cold
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method:
Sampler: <u>ZJT</u>	(attach shipping bill, if any)

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: <u>ZJT</u> Time: <u>14:21</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>Zach T</u> Date: <u>8/25/20</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>Shannon + Wilson</u>	Company: _____	Company: _____

Instructions
Requested Turnaround Time: <u>10 days Standard</u>
Special Instructions: <u>S+W / SGS PSA</u>

Received By: 1.	Received By: 2.	Received By: 3.
Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: <u>Michelle Alban</u> Time: <u>14:21</u>
Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: <u>Michelle Alban</u> Date: <u>8/25/20</u>
Company: _____	Company: _____	Company: <u>SGS</u>

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

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e-Sample Receipt Form

SGS Workorder #:

1204499

1204499

Review Criteria		Condition (Yes, No, N/A)	Exceptions Noted below			
Chain of Custody / Temperature Requirements			Yes	Exemption permitted if sampler hand carries/delivers.		
Were Custody Seals intact? Note # & location		N/A				
COC accompanied samples?		Yes				
DOD: Were samples received in COC corresponding coolers?		N/A				
<input checked="" type="checkbox"/> Yes **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required Temperature blank compliant* (i.e., 0-6 °C after CF)?		Yes	Cooler ID:	1	@	2.8 °C Therm. ID: D45
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.			Cooler ID:		@	°C Therm. ID:
			Cooler ID:		@	°C Therm. ID:
			Cooler ID:		@	°C Therm. ID:
			Cooler ID:		@	°C Therm. ID:
*If >6°C, were samples collected <8 hours ago?		N/A				
If <0°C, were sample containers ice free?		N/A				
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.						
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.				
Were samples received within holding time?			Yes			
Do samples match COC** (i.e., sample IDs, dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information			Yes			
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)			Yes			
Were proper containers (type/mass/volume/preservative***) used?			N/A	***Exemption permitted for metals (e.g.200.8/6020A).		
Volatile / LL-Hg Requirements						
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?			Yes			
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?			Yes			
Were all soil VOAs field extracted with MeOH+BFB?			N/A			
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.						
Additional notes (if applicable):						



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1204499001-A	HCL to pH < 2	OK			
1204499001-B	HCL to pH < 2	OK			
1204499001-C	HCL to pH < 2	OK			
1204499002-A	HCL to pH < 2	OK			
1204499002-B	HCL to pH < 2	OK			
1204499002-C	HCL to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

LABORATORY DATA REVIEW CHECKLIST

Completed by: Jessa Tibbetts
Title: Environmental Scientist
Date: September 15, 2020

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.
Laboratory Report Number: 1204499
Laboratory Report Date: August 24, 2020

Contaminated Site Name: Youngs Firehouse
ADEC File Number: 2100.26.222
Hazard Identification Number: 23861

(NOTE: NA = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes** / No / NA
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**
Comments: *The samples were not transferred or sub-contracted.*

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)? **Yes** / No / NA
Comments:
- b. Correct analyses requested? **Yes** / No / NA
Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)? **Yes** / No / NA
Comments: *The temperature blank was 2.8 ° Celsius.*

- b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes**/ No / NA

Comments:

- c. Sample condition documented - broken, leaking (MeOH), zero headspace (VOC vials)? **Yes**/ No / NA

Comments:

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.? **Yes** / No / **NA**

Comments: *No discrepancies were noted.*

- e. Data quality or usability affected?

Comments: *Data quality/usability unaffected.*

4. Case Narrative

- a. Present and understandable? **Yes**/ No / NA

Comments:

- b. Discrepancies, errors or QC failures noted by the lab? **Yes**/ No / NA

Comments:

- 8260D - LCSD recovery for chloroethane does not meet QC criteria. This analyte was not reported above the LOQ in the associated samples.
- 8260D - LCS/LCSD RPDs for chloroethane and trichlorofluoromethane do not meet QC criteria. These analytes were not reported above the LOQ in the associated samples.

- c. Were all corrective actions documented? **Yes** / **No** / NA

Comments:

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

Comments: *The case narrative does not discuss the effects on data quality/usability. It is noted that chloroethane and trichlorofluoromethane were not analyzed as part of the work order.*

5. Sample Results

- a. Correct analyses performed/reported as requested on COC? **Yes**/ No / NA

Comments:

- b. All applicable holding times met? **Yes**/ No / NA

Comments:

- c. All soils reported on a dry weight basis? **Yes / No / NA**
Comments: *Soil samples were not a part of this sampling effort.*
- d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA**
Comments:
- e. Data quality or usability affected?
Comments:

6. QC Samples

a. Method Blank

- i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA
Comments:
- ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?
Yes / No / NA
Comments:
- iii. If above LOQ or project specified objectives, 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
Comments: *See above.*
- v. Data quality or usability affected?
Comments:

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**
Comments:
- ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA**
Comments:

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable. (AK petroleum methods: AK 101 60%-120%, AK 102 75%-125%, AK 103 60%-120%; all other analyses see the laboratory QC pages) Yes **No** NA

Comments: *The LCSD recovery for chloroethane did not meet QC criteria. The sample was not analyzed for chloroethane; therefore, this data was not presented in the laboratory report.*

- iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits and project specified objectives, if applicable. RPD reported from LCS/LCSD, and/or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** No / NA

Comments: *The LCS/LCSD RPDs for chloroethane and trichlorofluoromethane do not meet QC criteria. The sample was not analyzed for chloroethane and trichlorofluoromethane; therefore, this data were not presented in the laboratory report.*

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

Comments: *The project sample was not analyzed for chloroethane and trichlorofluoromethane; therefore, are not affected by the %R or RPD failures.*

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

Yes / No / **NA**

Comments: *See above*

- vii. Data quality or usability affected?

Comments: *Data quality/usability unaffected; see above.*

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

- i. Organics - One MS/MSD reported per matrix, analysis, and 20 samples?

Yes / No / NA

Comments:

- ii. Metals/Inorganics - One MS and one MSD reported per matrix, analysis and 20 samples? Yes / No / **NA**

Comments: *There were no metals/inorganic analysis in this work order.*

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable. (AK petroleum methods: AK 101 60%-120%, AK 102 75%-125%, AK 103 60%-120%; all other analyses see the laboratory QC pages) Yes **No** NA

Comments:

- iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits and project specified objectives, if applicable. RPD reported from MS/MSD, and/or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA

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**

Comments:

- vii. Data quality or usability affected?

Comments: *No, see above.*

d. Surrogates - Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

- i. Are surrogate/IDA recoveries reported for organic analyses - field, QC, and laboratory samples? **Yes** / No / NA

Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes** / No / NA

Comments:

- iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined? **Yes** / No / **NA**

Comments:

- iv. Data quality or usability affected?

Comments:

e. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.)

- i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? **Yes** / No / NAs

Comments:

- ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes** / **No** / NA

Comments: *The sample and trip blank were transported in one cooler.*

iii. All results less than LOQ and project specified objectives? **Yes** / No / NA

Comments:

iv. If above LOQ or project specified DQOs, what samples are affected?

Comments:

v. Data quality or usability affected?

Comments:

f. Field Duplicate

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

Yes **No** / NA

Comments: *A sample duplicate was not included in the project work plan.*

ii. Were the field duplicates submitted blind to the lab? **Yes** / No / **NA**

Comments:

iii. Precision – All relative percent differences (RPDs) less than specified project objectives? (Recommended: 30% for water, 50% for soil) **Yes** / No / **NA**

Comments:

iv. Data quality or usability affected?

Comments:

g. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below).

Yes / **No** / NA

Comments:

i. All results less than LOQ and project specified objectives?

Yes / No / **NA**

Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

iii. Data quality or usability affected?

Comments:

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

a. Defined and appropriate? **Yes** / No / NA

Comments: *A key to qualifiers is provided on Page 3 of the SGS Laboratory Report and in the notes of Table 2.*

ATTACHMENT 3
IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

IMPORTANT INFORMATION