

**Monitoring Well Installation and  
2020 Groundwater Monitoring  
Williams Express Site No. 5021  
6010 Old Seward Highway  
Anchorage, Alaska**

**September 2020**

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**ACRONYMS AND ABBREVIATIONS**

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska Method
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
Discovery	Discovery Drilling, Inc.
DQO	Data quality objective
DRO	Diesel range organics
EPA	Environmental Protection Agency
GRO	Gasoline range organics
IDW	Investigation-derived waste
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MOA	Municipality of Anchorage
MS/MSD	Matrix spike/matrix spike duplicate
mV	Millivolt
NAPL	Non-aqueous phase liquid
NTU	Nephelometric Turbidity Units
ORP	Oxidation-reduction potential
PAHs	Polynuclear aromatic hydrocarbons
PID	Photoionization detector
ppm	Parts per million
P&T	Pump and treat
PVC	Polyvinyl chloride
RPD	Relative percent difference
SGS	SGS North America Inc.
UST	Underground storage tank
VES	Vapor extraction system
VOCs	Volatile organic compounds
WES	Williams Express Site



**MONITORING WELL INSTALLATION AND  
2020 GROUNDWATER MONITORING  
WILLIAMS EXPRESS SITE NO. 5021  
6010 OLD SEWARD HIGHWAY  
ANCHORAGE, ALASKA**

**1.0 INTRODUCTION**

This report presents the results of Shannon & Wilson's monitoring well installation and 2020 groundwater monitoring event conducted at Williams Express Site (WES) No. 5021.

**2.0 BACKGROUND**

At least 19 underground storage tanks (USTs) have been in use at or near WES No. 5021 since the late 1950s. The earliest formal records of on-site tank installations are four USTs that were installed in 1975. A vapor extraction system (VES) and groundwater pump-and-treat (P&T) system were installed at the site in December 1990 and October 1991, respectively. The P&T system function was limited due to low water table conditions and was shut down in January 2004. The VES system was last operated in 2007 and decommissioned in 2013. As part of ongoing site characterization activities, 40 groundwater monitoring wells have been installed at the site and neighboring properties. Many of these wells were decommissioned prior to 2016. In addition, during road construction activities conducted by the Municipality of Anchorage (MOA) in 2016, Monitoring Wells MW-9, MW-35, MW-36, MW-41, MW-43, and MW-44 were assumed destroyed. At this time, eight groundwater monitoring wells, including Wells MW-1R, MW-30, MW-31, MW-32, MW-39, MW-40, MW-42, and B5MW, remained at the site. The approximate locations of select former and existing wells are shown on Figure 1.

On July 26, 2017, representatives of Williams (Mr. Lee Andrews), ADEC (Mr. Bill O'Connell), and Shannon & Wilson (Mr. Dan McMahon) met to discuss the current regulatory status of WES 5021. During the meeting, it was agreed that replacement groundwater monitoring wells would be placed downgradient of WES 5021 and biennial groundwater monitoring would be conducted.

The project was performed in material accordance with our November 8, 2017 *Groundwater Monitoring Well Installation and Sampling Work Plan, Former Williams Express Site No. 5021, 6010 Old Seward Highway, Anchorage, Alaska*. The work plan was originally approved by Mr. Bill O'Connell of the ADEC on November 16, 2017 in the form of an email. At the request of the ADEC, the work plan was modified via email. The modifications, including using low-flow sampling procedures and decommissioning Monitoring Well MW-39. Ms. Janice Wieggers of the ADEC approved the modifications in an email dated June 29, 2020.

### 3.0 FIELD ACTIVITIES

Field work for this project consisted of decommissioning one monitoring well, advancing five borings, installing five monitoring wells, collecting soil and groundwater samples, and management of investigation-derived waste (IDW). Prior to advancing the borings, the local utility locate center was contacted to mark buried utilities within the project area. Several borings were moved slightly from the locations presented in our work plan due to the presence of buried utilities. The general site features are shown on Figure 1. Photographs of advancing the soil borings and installation of the monitoring wells are included in Appendix A. Boring and well construction logs are provided in Appendix B. Field notes are included as Appendix C. It should be noted that the field notes presented in Appendix C are provided for informational purposes only. Tables 1 through 6, and the boring logs and well completion logs presented in Appendix B represent our interpretation of the field data, and take precedent over the field notes.

#### 3.1 Monitoring Well Decommissioning

While conducting utility locates, it was noted that Monitoring Well MW-39 was damaged, and an obstruction was encountered at approximately 19 feet below ground surface (bgs). Therefore, with ADEC approval, the well was decommissioned and replaced with Monitoring MW-49. Monitoring Well MW-39 was decommissioned in general accordance with the ADEC's September 2013 *Monitoring Well Guidance* on June 30, 2020 by Discovery Drilling, Inc. (Discovery).

The protective well casing monument was removed from the ground. Due to the obstruction, the well cap could not be separated from the well casing. Therefore, the entire polyvinyl chloride (PVC) well casing and screen were removed from the ground, allowing the aquifer materials to collapse into the borehole. The remainder of the borehole was sealed with bentonite chips to approximately 2 feet bgs. Pea gravel was placed above the bentonite.

#### 3.2 Soil Borings and Sampling

Five soil borings, designated Borings B-45, B-46, B-47, B-48, and B-49 were advanced by Discovery on June 30 and July 1, 2020 in the approximate locations of former Monitoring Wells MW-41, MW-9, MW-36, MW-35, and MW-39, respectively. The borings were advanced utilizing a truck-mounted drill rig with 4.25-inch inside diameter hollow-stem augers.

Soil samples from the borings were collected with 3-inch outside diameter split spoon samplers driven by a 340-pound hammer. Field screening samples were collected at 5-foot intervals to about 15 feet bgs and then 2.5-foot intervals to the soil/water interface in each boring. Immediately following retrieval and opening of the split-spoon samplers, analytical samples and field screening samples were collected. The analytical sample jars for volatile analyses were

collected first, followed by the non-volatile analytical sample jars, and finally the field screening sample. The soil samples were “screened” for volatile organic vapors using a Thermo Instruments OVM 580B photoionization detector (PID) and an ADEC-approved headspace screening technique. The PID was calibrated before screening activities with 100 parts per million (ppm) isobutylene standard gas. The field screening samples were collected in re-sealable plastic bags by filling them with freshly exposed soil to one-half of their volumes, sealing the top, warmed to at least 40 degrees Fahrenheit, and screened within 10 minutes to one hour of collection. Screening was accomplished by inserting the PID sampling probe into the air space above the soil in the bag. The field screening results are presented in Table 1 and Appendix B.

One analytical soil sample was collected from each boring. Samples were collected from just above the soil/water interface observed during drilling or from the sample interval with the highest PID measurement. Shannon & Wilson’s field representative used clean stainless-steel spoons and wore new nitrile gloves to transfer the soil into laboratory supplied containers for analysis. For each volatile sample, at least 25 grams of soil, but no more than what can be completely submerged with 25-milliliters of methanol, was placed into a pre-weighted, 4-ounce jar with a septa lid. A 25-milliliter aliquot of methanol containing laboratory-added surrogates was added to the sample jar to submerge the soil sample. For each non-volatile sample, the laboratory-supplied jar was completely filled with soil taking care to avoid pieces of gravel and debris. Sample jars were filled using decontaminated stainless-steel spoons, placed in coolers with ice packs, and transferred to the laboratory using chain-of-custody procedures. Table 1 summarizes the soil sample locations and depths.

### **3.3 Monitoring Well Installation**

Borings B-45 through B-49 were completed as Monitoring Wells MW-45 through MW-49, respectively. Groundwater was encountered at approximately 21.5 (Borings B-48 and B-49) to 27.5 feet bgs (Boring B-45) in the borings. The borings were advanced approximately 5 feet beyond the soil/water interface to install the groundwater monitoring wells.

The monitoring wells were constructed of 2-inch nominal inside diameter schedule 40 PVC pipe with threaded connections. The lower 10-foot section of each well was constructed of PVC well screen with 0.010-inch slots. A sand pack of #10/20 silica sand was used to backfill around the well screen to approximately 1.5 to 3.5 feet above the screened section. About 5 feet of hydrated bentonite chips were used to backfill the boreholes above the sand pack. Drill cuttings were placed above the bentonite chips to about 1.5 to 2.0 feet bgs. Pea gravel was placed above the drill cuttings. Flush mount protective casings were installed and embedded in pea gravel (Well MW-49), concrete (Well MW-48) or asphalt (Wells MW-45, MW-46, and MW-47).

### 3.4 Monitoring Well Development

The monitoring wells were developed between July 17 and 20, 2020 using a surge block and a submersible pump. Three to five-minute periods of surging were alternated with periods of pumping. Water quality parameters, including pH, temperature, oxidation-reduction potential (ORP), turbidity, and conductivity were measured to evaluate the effectiveness of the development process.

Development of Monitoring Wells MW-46 and MW-47 were considered complete once stabilization criteria were met over three successive readings: pH was within 0.1 unit, temperature was within 3 percent (minimum 0.2 degree Celsius), conductivity was within three percent, and turbidity was within 10 percent. During development, approximately 46 and 52 gallons of water were removed from Wells MW-46 and 47, respectively.

Wells MW-45, MW-48, and MW-49 purged dry multiple times during development. These wells were allowed to recover to 80 percent of their pre-purge water column, surged for approximately 5 minutes, and then purged dry again. Development was considered complete after three hours of effort was expended at each of these wells. During development, approximately 5.3, 4.3, and 16.5 gallons of water were removed from Wells MW-45, MW-48, and MW-49, respectively. Groundwater data, including final water quality parameter measurements during development, are summarized in Table 2.

### 3.5 Monitoring Well Sampling

The 2020 groundwater sampling event was conducted on July 28, 2020 and consisted of collecting samples from Wells MW1R, MW-42, and MW-45 through MW-49. In addition, Well B5MW was screened for the presence of non-aqueous phase liquid (NAPL). NAPL was not documented in the well. Wells MW-30, MW-31, MW-32 are located on a parcel which was formerly owned by Sears. According to Williams, the property has changed ownership and Williams will work toward acquiring an access agreement. Well MW-40 is accessed via private property. Access to the well was not provided by the property owner during the sampling event.

Prior to collecting groundwater samples, the static water level was measured in the wells using an electronic water level indicator. The monitoring wells were purged and sampled using a low-flow sampling technique, using a submersible pump with disposable vinyl tubing. Sampling was initiated by purging each well to reduce the effect of stagnant well casing water on chemical concentrations and to obtain groundwater samples that are representative of the surrounding water-bearing formation. The submersible pump was placed within 2 feet of the measured groundwater depth in each well. The pump rate was set at approximately 0.1 to 0.5 liter per minute (L/min) with a goal of limiting the sustained water drawdown to a maximum of 4 inches. The drawdown was determined using an electronic water probe that was checked regularly throughout the purging/sampling process.

During the purging process, water quality parameters (pH, temperature, turbidity, ORP, and conductivity) were recorded at 3 to 5-minute intervals. Purging was considered complete when at least one well volume was removed and at least four of the following stabilization criteria were met over three successive readings: pH was within 0.1 unit, temperature was within 3 percent (minimum 0.2 degree Celsius), ORP was within 10 millivolts (mV), specific conductance was within three percent, and turbidity was within 10 percent or three consecutive readings of less than 10 Nephelometric Turbidity Units (NTU). The pump was decontaminated in between each well. Analytical samples were collected by transferring water directly from the disposable tubing into the laboratory supplied containers. The sample jars were filled in decreasing order of volatility. Monitoring well sampling data are presented in Table 3. A survey of the monitoring wells will be conducted prior to the next sampling event.

### **3.6 Investigation-Derived Waste Management**

IDW for this project consisted of a well casing, a protective monument, soil cuttings, and development and purge water. The well casing and protective monument was disposed of as unregulated solid waste. Soil cuttings were containerized in ten 55-gallon drums and development water and purge water was containerized in four 55-gallon drums. The drums were collected daily by NRC Alaska, LLC for offsite disposal and/or treatment. Disposal receipts are included in Appendix D.

## **4.0 LABORATORY ANALYSES**

The analytical soil and groundwater samples were submitted to SGS North America Inc. (SGS) for analytical testing, using chain-of-custody procedures. The laboratory reports and completed ADEC Laboratory Data Review Checklists are provided in Appendix E.

The five analytical soil samples and eight groundwater samples, including one duplicate, were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101; diesel range organics (DRO) by AK 102; and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B. The groundwater samples were also analyzed for residual range organics (RRO) by AK 103. One soil sample was also analyzed for volatile organic compounds (VOCs) by EPA Method 8260D, in lieu of BTEX, and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM. A soil duplicate sample was inadvertently not collected. Soil and water trip blanks accompanied the samples and were analyzed for GRO by AK 101 and BTEX by EPA Method 8021B or VOCs by EPA Method 8260D. The analytical soil and groundwater sample results are summarized in Tables 4 and 5, respectively.

## 5.0 SUBSURFACE CONDITIONS

Subsurface soil conditions observed during the current site characterization efforts are presented in the boring logs included as Appendix B.

Soil encountered in the borings generally consisted of layers of sand and silt with varying gravel content, overlying gravel with silt and sand. Groundwater was typically encountered within the gravel layer.

As part of ongoing site characterization activities, a perched and/or seasonal water layer has been observed in several wells at depths less than 15 feet bgs. This perched layer was not documented during the current site characterization efforts. A deeper aquifer is located within more permeable material (sand and gravel) beneath less permeable material (silt and silty sand).

During drilling, groundwater was encountered between approximately 21.5 to 27.5 feet bgs. The measured static depth to water ranged from approximately 21.12 feet bgs in Well MW-48 to about 26.97 feet bgs in Well MW-42. These depths are generally consistent with previous site data. Based on historical data, the local groundwater flow direction in the vicinity of WES No. 5021 is generally to the southwest.

## 6.0 DISCUSSION OF ANALYTICAL RESULTS

The analytical soil and groundwater results were compared to ADEC cleanup levels in the October 2018, 18 Alaska Administrative Code (AAC) 75 regulations. The applicable soil criteria consist of the most stringent ADEC Method Two cleanup levels listed in Tables B1 and B2 of 18 AAC 75.341, for the “under 40-inch (precipitation) zone,” and groundwater cleanup levels are established in Table C of 18 AAC 75.345. Historical groundwater analytical results are tabulated in Table 6.

### 6.1 Soil Samples

Benzene was detected above the ADEC Method Two cleanup level of 0.022 milligrams per kilogram (mg/kg) in Sample B46S8 (0.233 mg/kg), collected from Boring B46. Toluene and ethylbenzene were also detected in Sample B46S8, at concentrations less than applicable ADEC cleanup levels. The remaining samples did not contain detectible concentrations of the target analytes.

### 6.2 Groundwater Samples

The groundwater samples collected from Monitoring Wells MW1R and MW-42 contained concentrations of GRO (maximum of 25.3 J+ milligrams per liter [mg/L]), DRO (maximum of 8.43 mg/L), benzene (maximum of 0.145 mg/L), ethylbenzene (maximum of 0.507 mg/L), and



xylenes (maximum of 11.0 mg/L) exceeding the ADEC Table C cleanup levels of 2.2 mg/L, 1.5 mg/L, 0.0046 mg/L, 0.015 mg/L, and 0.19 mg/L, respectively. Well MW1R is located on the former WES 5021 property and Well MW-42 is located southwest of the former WES 5021 property. The Well MW1R analytical sample results are generally consistent with the historical sample results. Well MW-42 has been sampled three times and the concentrations of benzene and GRO detected during the current sampling event represent a reduction in contaminant concentrations. DRO is generally consistent with previous results, although this is the first event that DRO has exceeded the ADEC cleanup level.

Well MW-46 is located southwest of the former WES 5021 property in the approximate location of former Well MW-9. The sample collected from Well MW-46 contained 0.239 mg/L benzene, 0.0705 mg/L ethylbenzene, and 0.191 mg/L xylenes, which exceed the applicable ADEC cleanup levels. The remaining tested analytes were detected at concentrations less than the ADEC cleanup levels. The results are generally less than the Well MW-9 historical results.

Concentrations of target analytes were either not detected or were detected at concentrations less than the ADEC cleanup levels in the samples collected from Monitoring Wells MW-45, MW-47, MW-48, and MW-49. These wells were installed to replace wells which were destroyed during road construction activities. The 2020 sampling results are consistent with the results associated with the previous wells.

### **6.3 Quality Control Samples**

The project laboratory follows on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, matrix spike/matrix spike duplicates (MS/MSD), and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to assess precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the case narrative of their laboratory reports (see Appendix E).

External quality controls included duplicate samples and trip blanks. One duplicate water sample set (MW-1R/MW-10R) was collected to assess precision of the sampling and analysis processes using the calculated relative percent difference (RPD). The RPDs are within the ADEC recommended DQO of 30 percent for water. A soil duplicate sample was inadvertently not collected.

One soil trip blank and one water trip blank accompanied the sample jars and bottles from the laboratory to the site during sampling activities and back again to SGS. The soil and water trip blanks did not contain detectable concentrations of the target analytes, indicating that the

groundwater samples collected were not cross contaminated during the sample handling, storage, or testing process.

Estimated concentrations of GRO and DRO were detected in the method blanks associated with the soil samples. Estimated concentrations of GRO and/or DRO were detected in at least one project sample. These sample results are reported as non-detect at the limitation of quantitation and flagged "B" on Table 4.

Shannon & Wilson conducted a limited data assessment to review the laboratory's compliance with precision, accuracy, sensitivity, and completeness to the data quality objectives. Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist for each data package, which are included in Appendix E. No non-conformances that would adversely affect data usability were noted, with the exceptions noted above.

## 7.0 SUMMARY

The project included decommissioning one groundwater monitoring well (Well MW-39), installing five replacement wells (Wells MW-45 through MW-49), and collecting soil and groundwater samples. With the exception of the soil sample collected from Boring B-46, the soil samples did not contain contaminant concentration exceeding the ADEC cleanup levels.

Based on the current groundwater data, the horizontal extent of the groundwater contaminant plume, south of the former WES 5021 property, is currently defined to the south by Wells MW-47 and MW-48, to the east by Well MW-45, and to the west by Well MW-49.

## 8.0 CLOSURE/LIMITATIONS

This report is prepared for the exclusive use of our client and their representatives in the study of this site. The findings presented within this report are based on the limited research, sampling, and analyses that were conducted. They should not be construed as definite conclusions regarding the site's soil or groundwater quality. The sampling, analyses, and data interpretations can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantee 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 characterization activities. 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 may need to be revised.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for



reporting these findings and therefore has not, and will not, disclose the results of this study unless specifically requested and authorized by Williams, or as required by law.

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

We appreciate this opportunity to be of service and your continued confidence in our firm. If you have questions or comments concerning this submittal, please contact the undersigned at (907) 561-2120.

**SHANNON & WILSON, INC.**

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TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 1 and Appendix B)	Depth (feet bgs)	Headspace (ppm) ^
<b>SOIL SAMPLES</b>				
<u>Boring B-45</u>				
B45S1	6/30/2020	Boring B-45, Sample S1	0.5-2.5	0.5
B45S2	6/30/2020	Boring B-45, Sample S2	5-7	0
B45S3	6/30/2020	Boring B-45, Sample S3	10-12	0
B45S4	6/30/2020	Boring B-45, Sample S4	15-16.5	0
B45S5	6/30/2020	Boring B-45, Sample S5	17.5-19	0
B45S6	6/30/2020	Boring B-45, Sample S6	20-21.5	0.4
B45S7	6/30/2020	Boring B-45, Sample S7	22.5-24	0
* B45S8	6/30/2020	Boring B-45, Sample S8	25-26.5	0
B45S9	6/30/2020	Boring B-45, Sample S9	27.5-29	0
B45S10	6/30/2020	Boring B-45, Sample S10	30-31.5	-
<u>Boring B-46</u>				
B46S1	6/30/2020	Boring B-46, Sample S1	0.5-2.5	1.2
B46S2	6/30/2020	Boring B-46, Sample S2	5-7	0.7
B46S3	6/30/2020	Boring B-46, Sample S3	10-12	0.7
B46S4	6/30/2020	Boring B-46, Sample S4	15-16.5	1.4
B46S5	6/30/2020	Boring B-46, Sample S5 (No Sample)	17.5-19	-
B46S6	6/30/2020	Boring B-46, Sample S6 (No Sample)	20-21.5	0.9
B46S7	6/30/2020	Boring B-46, Sample S7	22.5-24	-
* B46S8	6/30/2020	Boring B-46, Sample S8	25-26.5	1.2
B46S9	6/30/2020	Boring B-46, Sample S9	27.5-29	-
<u>Boring B-47</u>				
B47S1	7/1/2020	Boring B-47, Sample S1	0.5-2.5	0.1
B47S2	7/1/2020	Boring B-47, Sample S2	5-7	0.1
B47S3	7/1/2020	Boring B-47, Sample S3	10-12	0.4
* B47S4	7/1/2020	Boring B-47, Sample S4	15-15.8	1.7
B47S5	7/1/2020	Boring B-47, Sample S5	17.5-19	1.4
B47S6	7/1/2020	Boring B-47, Sample S6	20-21.5	0.9
B47S7	7/1/2020	Boring B-47, Sample S7	22.5-24	0.9
<u>Boring B-48</u>				
B48S1	7/1/2020	Boring B-48, Sample S1	0.5-2.5	0.2
B48S2	7/1/2020	Boring B-48, Sample S2	5-7	1.5
B48S3	7/1/2020	Boring B-48, Sample S3	10-12	0.2
B48S4	7/1/2020	Boring B-48, Sample S4	15-16.5	0.3
* B48S5	7/1/2020	Boring B-48, Sample S5	17.5-19	0.3
B48S6	7/1/2020	Boring B-48, Sample S6	20-21.5	0
B48S7	7/1/2020	Boring B-48, Sample S7	22.5-24	-
<u>Boring B-49</u>				
B49S1	7/1/2020	Boring B-49, Sample S1	0.8-2.3	0
B49S2	7/1/2020	Boring B-49, Sample S2	5-6.5	1.0
B49S3	7/1/2020	Boring B-49, Sample S3	10-11.5	0
B49S4	7/1/2020	Boring B-49, Sample S4	15-16.5	0
B49S5	7/1/2020	Boring B-49, Sample S5	17.5-19	0
* B49S6	7/1/2020	Boring B-49, Sample S6	20-21.5	0
B49S7	7/1/2020	Boring B-49, Sample S7	22.5-24	-

Notes on Page 2

**TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS**

Sample Number	Date	Sample Location (See Figure 1 and Appendix B)	Depth (feet TOC)	Headspace (ppm) ^
<b><u>WATER SAMPLES</u></b>				
* MW1R	7/28/2020	Well MW1R	22.82	-
* MW10R~	7/28/2020	Duplicate of Sample MW1R	22.82	-
* MW-42	7/28/2020	Well MW-42	26.97	-
* MW-45	7/28/2020	Well MW-45	26.81	-
* MW-46	7/28/2020	Well MW-46	25.53	-
* MW-47	7/28/2020	Well MW-47	22.39	-
* MW-48	7/28/2020	Well MW-48	21.12	-
* MW-49	7/28/2020	Well MW-49	21.85	-
<b><u>QUALITY CONTROL SAMPLES</u></b>				
* STB	7/1/2020	Soil Trip Blank	-	-
* WTB	7/28/2020	Water Trip Blank	-	-

## Notes:

- \* = Sample analyzed by the project laboratory (See Tables 4 and 5)
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- = Not measured
- bgs = Below ground surface
- ppm = Parts per million
- TOC = Top of casing

TABLE 2 - MONITORING WELL DEVELOPMENT LOG

	Monitoring Well Number				
	MW-45	MW-46	MW-47	MW-48	MW-49
<b>Development Data</b>					
Development Date	7/17/20	7/17/20	7/20/20	7/20/20	7/20/20
Time Water Level Measured	9:10	12:20	10:50	9:25	13:56
Measured Depth to Water (ft below TOC)	26.81	25.52	22.27	21.10	21.14
Total Depth of Well (ft below TOC)	34.06	29.11	26.56	26.00	27.22
Water Column in Well (ft)	7.25	3.59	4.29	4.90	6.08
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch
Gallons per Foot	0.16	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	1.16	0.57	0.69	0.78	0.97
Total Volume Pumped/Bailed (gallons)	5.3	46	52	4.3	14.3
Development Method	Submersible Pump & Surge Block	Submersible Pump & Surge Block	Submersible Pump & Surge Block	Submersible Pump & Surge Block	Submersible Pump & Surge Block
<b>Water Quality Data</b>					
Date Measured	7/17/20	7/17/20	7/20/20	7/20/20	7/20/20
Temperature (°C)	12.7	10.6	11.6	10.3	11.9
pH (Standard Units)	6.72	7.36	7.26	7.83	8.06
Specific Conductivity (µS/cm)	401	952	426	528	476
ORP (mV)	151	-96	829	406	404
Turbidity (NTU)	>1,000	225	376	>1,000	>1,000
<b>Remarks</b>	Well purged dry during development			Well purged dry during development	Well purged dry during development

## Notes:

Water quality parameters were measured with Hanna, Hach, and YSI Instruments

**KEY DESCRIPTION**

-	Not applicable
^	Depth to water measurement prior to development
TOC	Top of casing
ft	Feet
°C	Degrees Celsius
µS/cm	Microsiemens per Centimeter
NTU	Nephelometric Turbidity Unit
mV	Millivolts

TABLE 3 - MONITORING WELL SAMPLING LOG

**WATER LEVEL MEASUREMENT DATA**

Well Number	MW1R	MW-42	MW-45	MW-46
Date Water Level Measured	7/28/2020	7/28/2020	7/28/2020	7/28/2020
Time Water Level Measured	13:30	13:30	11:50	10:40
Measured Depth to Water (ft below MP)	22.82	26.97	26.81	25.53

**SAMPLING DATA**

Well Number	MW1R	MW-42	MW-45	MW-46
Date Sampled	7/28/2020	7/28/2020	7/28/2020	7/28/2020
Time Sampled	14:15	14:50	15:40	11:20
Measured Depth to Water (ft below MP)	22.82	26.97	26.81	25.53
Total Depth of Well (ft below MP)	32.33	34.92	34.20	28.96
Water Column in Well (ft)	9.51	7.95	7.39	3.43
Screened interval (ft below ground surface)*	21.4-31.4	25.0-35.0	24.0-34.0	19.25-29.25
Gallons per Foot	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	1.52	1.27	1.18	0.55
Total Volume Pumped/Bailed (gallons)	1.6	6.0	1.3	2.5
Sampling Method	SP	SP	SP	SP
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch
Remarks	Duplicate Sample MW- 10R		Well purged dry during sampling	

**WATER QUALITY DATA**

Well Number	MW1R	MW-42	MW-45	MW-46
Temperature (°C)	14.4	11.8	17.6	11.5
Specific Conductivity (µS/cm)	1,430	816	248	821
pH (Standard Units)	6.63	6.04	6.75	6.61
Turbidity (NTU)	14.6	7.74	331	28.1
ORP (mV)	5.0	64.8	6.0	-73
Dissolved Oxygen (mg/L)	0.86	0.32	-	5.46

Note: Water quality parameters were measured with Hanna, Hach, and YSI instruments.

**KEY DESCRIPTION**

°C	Degrees Celsius
ft	Feet
µS/cm	Microsiemens per Centimeter
mg/L	Milligrams per liter
MP	Measuring Point
SP	Submersible Pump
NTU	Nephelometric turbidity units
-	Not applicable or measurement not collected
NS	Not sampled
DTW	Depth to water
*	At time of well installation

TABLE 3 - MONITORING WELL SAMPLING LOG

**WATER LEVEL MEASUREMENT DATA**

Well Number	MW-47	MW-48	MW-49	B5MW
Date Water Level Measured	7/28/2020	7/28/2020	7/28/2020	7/28/2020
Time Water Level Measured	9:32	8:45	10:27	16:00
Measured Depth to Water (ft below MP)	22.39	21.12	21.85	24.68

**SAMPLING DATA**

Well Number	MW-47	MW-48	MW-49	B5MW
Date Sampled	7/28/2020	7/28/2020	7/28/2020	NS
Time Sampled	10:15	10:05	11:23	NS
Measured Depth to Water (ft below MP)	22.39	21.12	21.85	24.68
Total Depth of Well (ft below MP)	26.65	25.90	28.04	31.99
Water Column in Well (ft)	4.26	4.78	6.19	7.31
Screened interval (ft below ground surface)*	16.7-26.7	16.0-26.0	18.5-28.5	27.5-37.5
Gallons per Foot	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	0.68	0.76	0.99	1.17
Total Volume Pumped/Bailed (gallons)	2.2	2.5	3.1	-
Sampling Method	SP	SP	SP	-
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch
Remarks				No product observed. DTW only.

**WATER QUALITY DATA**

Well Number	MW-47	MW-48	MW-49	B5MW
Temperature (°C)	10.9	8.15	8.69	-
Specific Conductivity (µS/cm)	449	608	502	-
pH (Standard Units)	6.12	4.11	6.40	-
Turbidity (NTU)	17.7	16.4	10.6	-
ORP (mV)	211	142	151	-
Dissolved Oxygen (mg/L)	5.41	0.46	0.47	-

Note: Water quality parameters were measured with Hanna, Hach, and YSI instruments.

<b><u>KEY</u></b>	<b><u>DESCRIPTION</u></b>
°C	Degrees Celsius
ft	Feet
µS/cm	Microsiemens per Centimeter
mg/L	Milligrams per liter
MP	Measuring Point
SP	Submersible Pump
NTU	Nephelometric turbidity units
-	Not applicable or measurement not collected
NS	Not sampled
DTW	Depth to water
*	At time of well installation

TABLE 4 - SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number^ and Soil Sample Depth in Feet bgs (Table 1 and Appendix B)					
			Soil Samples					Trip Blank
			B45S8 25-26.5	B46S8 25-26.5	B47S4 15-16.5	B48S5 17.5-19	B49S6 20-21.5	TB
PID Headspace Reading - ppm	580B PID	-	0	1.2	1.7	0.3	0	-
Gasoline Range Organics (GRO) - mg/kg	AK 101	300	<2.82 B	<3.27 B	<2.98 B	<1.81	<1.18 J-	<1.25
Diesel Range Organics (DRO) - mg/kg	AK 102	250	<21.7 B	<22.0 B	<21.4 B	<23.9 B	<11.2	-
Volatile Organic Compounds (VOCs)								
Benzene - mg/kg	EPA 8021B/8260D	0.022	<0.00705	<b>0.233</b>	<0.00745	<0.00905	<0.00590	<0.00630
Toluene - mg/kg	EPA 8021B/8260D	6.7	<0.0141	<b>0.0163 J</b>	<0.0149	<0.00181	<0.00118	<0.0126
Ethylbenzene - mg/kg	EPA 8021B/8260D	0.13	<0.0141	<b>0.0169 J</b>	<0.0149	<0.00181	<0.00118	<0.0126
Xylenes - mg/kg	EPA 8021B/8260D	1.5	<0.0424	<0.0490	<0.0447	<0.0545	<0.0354	<0.0377
Other VOCs - mg/kg	EPA 8260C	various	-	ND	-	-	-	ND
Polynuclear Aromatic Hydrocarbons (PAHs) - mg/kg	EPA 8270D-SIM	various	-	ND	-	-	-	-

**KEY DESCRIPTION**

- \* See Appendix E for compounds tested, methods, and laboratory reporting limits.
- \*\* Soil cleanup level is the most stringent Method Two standard listed in Table B1 or B2, 18 AAC 75, for the "under 40-inch (precipitation) zone" (October 2018).
- ^ Sample ID No. preceded by "101293" on the chain-of-custody form.
- ppm Parts per million
- mg/kg Milligrams per kilogram
- Not tested or not applicable
- <0.00705 Analyte not detected; laboratory limit of detection is 0.00705 mg/kg.
- 0.0163** Analyte detected at a concentration less than the applicable ADEC cleanup levels.
- 0.233** Reported concentration exceeds the ADEC's most stringent Method Two cleanup level.
- B Analyte concentration potentially affected by method blank contamination. See the ADEC Laboratory Data Review Checklist.
- J Estimated concentration less than the limit of quantitation (LOQ). See the laboratory report for details.
- J- Quantitation is an estimate (biased low) due to surrogate recovery failures. See ADEC LDRC in Appendix E for details.

TABLE 5 - SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/L)**	Sample Number^ and Groundwater Depth in Feet (See Tables 1 & 2 and Appendix B)								
			MW1R 22.82	MW10R~ 22.82	MW-42 26.97	MW-45 26.81	MW-46 25.53	MW-47 22.39	MW-48 21.12	MW-49 21.85	Trip Blank TB
Gasoline Range Organics (GRO) - mg/L	AK 101	2.2	<b>25.3 J+</b>	<b>25.3 J+</b>	<b>2.93</b>	<0.0500	<b>1.21 J+</b>	<0.0500	<0.0500	<0.0500	<0.0500
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	<b>8.43</b>	<b>8.37</b>	<b>1.56</b>	<b>0.212 J</b>	<b>0.333 J</b>	<0.288	<0.300	<b>0.276 J</b>	-
Residual Range Organics (RRO) - mg/L	AK 103	1.1	<b>0.448 J</b>	<b>0.579</b>	<b>0.183 J</b>	<b>0.173 J</b>	<b>0.215 J</b>	<0.240	<0.250	<b>0.243 J</b>	-
Aromatic Volatile Organics (BTEX)											
Benzene - mg/L	EPA 8021B	0.0046	<b>0.145</b>	<b>0.139</b>	<b>0.114</b>	<b>0.000240 J</b>	<b>0.239</b>	<b>0.000190 J</b>	<0.000250	<0.000250	<0.000250
Toluene - mg/L	EPA 8021B	1.1	<b>0.0534</b>	<b>0.0531</b>	<b>0.00119</b>	<0.000500	<b>0.000480 J</b>	<0.000500	<0.000500	<0.000500	<0.000500
Ethylbenzene - mg/L	EPA 8021B	0.015	<b>0.507</b>	<b>0.494</b>	<b>0.281</b>	<b>0.000370 J</b>	<b>0.0705</b>	<0.000500	<0.000500	<0.000500	<0.000500
Xylenes (Total) - mg/L	EPA 8021B	0.19	<b>11.0</b>	<b>8.88</b>	<b>0.926</b>	0.00553	<b>0.191</b>	<0.00150	<0.00150	<0.00150	<0.00150

**KEY DESCRIPTION**

- \* See Appendix E for compounds tested, methods, and laboratory reporting limits
- \*\* Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (October 2018).
- ^ Sample ID No. preceded by "101293" on the chain-of-custody form.
- <0.0500 Analyte not detected; laboratory reporting limit of 0.0500 mg/L.
- 0.448** Analyte detected
- Sample not tested for this analyte.
- ~ Duplicate of Sample MW1R
- mg/L Milligrams per liter
- 25.3** Reported concentration exceeds the regulated cleanup level.
- J Analyte detected below laboratory method detection limit.
- J+ Quantitation is an estimate (biased high) due to surrogate recovery failures. See ADEC LDRC in Appendix E for details.



**TABLE 6 - HISTORICAL GROUNDWATER DATA**

Well No.	Sample Date	Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)				
			Benzene	Total BTEX	GRO	DRO	RRO
MW-1	4/4/2006	29.01	4.69	52.9	75.6	6.40	-
	9/26/2006	27.32	7.27	74.0	-	5.87	-
	4/30/2007	27.15	2.16	42.5	75.0	6.33	-
	12/14/2007	27.05	2.37	58.3	97.7	4.97	-
	4/28/2008	27.06	0.941	38.5	86.2	4.34	-
	9/16/2008	26.61	0.486	33.7	68.5	4.59	-
	5/11/2009	27.76	0.125	17.8	44.6	5.79	-
	9/28/2009	28.02	0.649	42.0	83.1	5.10	-
	4/27/2010	27.02	0.531	15.3	38.2	5.20	-
	9/2/2010	25.81	1.16	48.6	89.3	4.51	-
	5/5/2011	26.07	0.324	16.6	40.0	6.78	-
	9/14/2011	25.97	0.424	27.9	54.1	6.95	-
	4/18/2012	25.60	0.340	19.3	51.2	5.87	-
	9/25/2012	24.65	0.843	33.3	62.1	4.31	-
	9/18/2013	25.60	0.498	20.0	53.2	4.62	-
Decommissioned by Tesoro in 2013							
MW-1R	Installed by Tesoro in April 2015 to replace source well MW-1						
	8/20/2015	24.15	0.236	11.7	31.5	7.26	-
	9/20/2016	23.37	0.606	11.3 J	31.2	11.7	-
	7/28/2020~	22.82	0.145	11.7	25.3 J+	8.43	0.579
MW-8A	4/4/2006	14.93	ND	0.00272	-	-	-
	9/26/2006	6.40	ND	ND	-	-	-
	4/27/2007	11.35	0.000517	0.00283	-	-	-
	12/18/2007	6.80	ND	ND	-	-	-
	6/2/2008	6.10	ND	ND	-	-	-
	9/16/2008	6.14	ND	ND	-	-	-
	5/11/2009	4.92	ND	0.00448 J	-	-	-
	9/28/2009	8.12	ND	ND	-	-	-
	4/27/2010	8.61	ND	0.0107	ND	-	-
	9/8/2010	7.30	ND	ND	-	-	-
	5/6/2011	6.01	ND	ND	-	-	-
	9/15/2011	7.64	ND	0.00466	-	-	-
	9/24/2012	3.33	NS	NS	NS	NS	NS
Removed from the sampling program in 2013 Well Decommissioned on June 26, 2015							
MW-9	4/4/2006	26.93	1.69	3.83	7.80	-	1.48
	9/26/2006	25.55	0.0264	0.07	ND	-	ND
	4/30/2007	25.98	1.94	5.30	8.98	-	1.80
	10/4/2007	25.55	2.01	5.42	9.46	-	ND
	4/29/2008	26.03	1.05	3.25	5.65	-	2.32
	9/16/2008	25.70	0.170	0.606	1.11	-	5.01
	5/11/2009	26.23	1.74	4.73	8.06	-	23.5
	9/28/2009	26.39	1.34	5.38	10.2	-	0.549
	4/27/2010	26.32	0.449	1.37	ND	-	1.67
	9/2/2010	25.69	2.13	8.19	15.4	-	1.32
	5/6/2011	25.97	1.26	4.83	9.22	-	1.74
	9/14/2011	25.89	1.63	7.63	14.2	-	1.86
	4/18/2012	25.92	1.42	5.40 J	10.1	-	2.35
	9/25/2012	24.40	1.99	8.82	17.2	-	0.903
	9/18/2013	24.98	0.567	2.48	5.63	-	4.60
	8/26/2014	25.81	0.288	0.334 J	0.721	-	3.57
	8/20/2015	26.45	0.463	1.31	2.75	-	4.89
9/20/2016	Assumed destroyed by road improvement project conducted in 2016.						

Key provided on Page 7.

TABLE 6 - HISTORICAL GROUNDWATER DATA

Well No.	Sample Date	Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)					
			Benzene	Total BTEX	GRO	DRO	RRO	
MW-10	4/4/2006	20.97	ND	ND	-	-	ND	
	9/26/2006	26.25	ND	ND	-	-	ND	
	4/30/2007	16.92	ND	ND	-	-	ND	
	10/4/2007	17.74	0.00121	0.03179	-	-	ND	
	4/28/2008	16.97	ND	0.00260	-	-	0.838	
	9/16/2008	17.44	0.000549	0.00882	-	-	<b>2.87</b>	
	5/11/2009	17.97	0.000843	0.00492 J	-	-	<b>3.47 J</b>	
	9/28/2009	18.37	ND	ND	-	-	ND	
	4/27/2010	17.84	ND	0.00880	-	-	0.787	
	9/2/2010	17.12	ND	ND	-	-	0.742	
	5/6/2011	17.18	ND	ND	-	-	0.569	
	9/14/2011	17.42	ND	0.00208	-	-	0.959	
	4/18/2012	16.53	ND	ND	-	-	0.350 J	
	9/25/2012	16.34	ND	ND	-	-	ND	
	9/17/2013	17.10	ND	ND	-	-	0.365 J	
	8/26/2014	37.87***	ND	ND	-	-	ND	
Well Decommissioned on June 26, 2015								
MW-16	9/2/2003	18.68	ND	ND	-	0.180	0.630	
	5/5/2004	21.75	ND	ND	-	0.321	ND	
	9/20/2004	18.93	ND	ND	-	ND	ND	
	3/31/2005	18.42	ND	0.00385	-	ND	ND	
Well decommissioned on October 27, 2005								
MW-19	5/5/2004	23.69	ND	ND	-	-	-	
	9/20/2004	22.50	ND	ND	-	-	-	
	3/31/2005	22.31	ND	0.00295	-	-	-	
	9/15/2005	21.42	ND	ND	-	-	-	
	4/4/2006	22.70	ND	ND	-	-	-	
	9/26/2006	Assumed destroyed by road improvement project.						-
MW-20	9/2/2003	19.97	ND	ND	-	-	-	
	4/15/2004	18.01	ND	ND	-	-	-	
	9/20/2004	19.42	ND	ND	-	-	-	
	3/31/2005	19.66	ND	0.00229	-	-	-	
	Sampling suspended due to consistently low or ND results							
	4/17/2012	17.43	ND	ND	-	-	-	
Well decommissioned on May 3, 2012								
MW-21	9/2/2003	20.03	ND	ND	-	-	-	
	5/15/2004	18.11	0.001	0.005	-	-	-	
	9/20/2004	19.23	ND	ND	-	-	-	
	3/31/2005	19.65	ND	ND	-	-	-	
	Well decommissioned on October 27, 2005							
MW-22	3/10/2003	12.93	ND	ND	ND	ND	0.21	
	9/2/2003	14.09	ND	ND	-	-	-	
Well decommissioned on October 27, 2005								
MW-24	3/10/2003	14.24	ND	ND	ND	0.72	<b>1.80</b>	
	9/2/2003	14.54	ND	ND	-	-	-	
Well decommissioned on October 27, 2005								

Key provided on Page 7.

**TABLE 6 - HISTORICAL GROUNDWATER DATA**

Well No.	Sample Date	Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)					
			Benzene	Total BTEX	GRO	DRO	RRO	
MW-25	4/4/2006	20.22	ND	ND	-	-	-	
	9/26/2006	17.90	ND	ND	-	-	-	
	4/27/2007	18.65	ND	ND	-	-	-	
	1/2/2008	18.42	ND	ND	-	-	-	
	4/29/2008	18.08	ND	ND	-	-	-	
	9/16/2008	17.63	ND	ND	-	-	-	
	5/11/2009	18.38	0.000157 J	0.00393 J	-	-	-	
	9/28/2009	18.27	ND	ND	-	-	-	
	4/27/2010	18.60	ND	0.00806	ND	-	-	
	9/2/2010	17.80	ND	ND	-	-	-	
	5/6/2011	18.13	ND	ND	-	-	-	
	9/15/2011	18.27	0.000322 J	0.00806	-	-	-	
	4/18/2012	18.07	ND	ND	ND	-	-	
	9/25/2012	16.25	ND	ND	-	-	-	
	9/17/2013	16.74	ND	ND	-	-	-	
8/26/2014	17.75	ND	ND	-	-	-		
Well Decommissioned on June 26, 2015								
MW-26	10/20/2009	26.56	0.00378	0.00378	ND	ND	-	
	5/7/2010	26.52	ND	ND	ND	ND	-	
	9/2/2010	25.78	ND	ND	ND	ND	-	
	5/5/2011	26.02	ND	0.000680 J	ND	ND	-	
	9/14/2011	25.99	0.000710	0.0102	0.211 J	0.0451 J	-	
	4/17/2012	25.90	Not sampled. Depth to water measurement only.					-
	9/24/2012	24.75	Not sampled. Depth to water measurement only.					-
	9/17/2013	25.81	Not sampled. Depth to water measurement only.					-
Assumed destroyed during Tesoro construction in 2013/2014.								
MW-27	10/20/2009~	24.50	<b>2.50</b>	48.1 E	<b>77.0</b>	1.37	-	
	4/27/2010 #	24.87	<b>4.52</b>	92.3	<b>178</b>	<b>57.1</b>	-	
	9/2/2010	23.62	<b>1.19</b>	38.1	<b>78.1</b>	<b>8.23</b>	-	
	5/6/2011	23.81	<b>0.342</b>	20.9	<b>46.6</b>	<b>16.4</b>	-	
	9/15/2011#	23.81	0.03 foot of product observed, not sampled					-
	4/17/2012#	23.80	0.05 foot of product observed, not sampled					-
Well decommissioned on May 3, 2012								
MW-28	10/20/2009	23.50	<b>5.30</b>	71.7 E	<b>132</b>	<b>2.19</b>	-	
	4/27/2010	23.76	<b>8.11</b>	59.7	<b>115</b>	<b>3.78</b>	-	
	9/2/2010	22.65	<b>8.23</b>	55.6	<b>97.3</b>	<b>3.58</b>	-	
	5/5/2011	22.90	<b>5.38</b>	49.8	<b>90.5</b>	<b>2.72</b>	-	
	9/15/2011	22.70	<b>5.45</b>	65.0	<b>103</b>	<b>3.32</b>	-	
	4/17/2012	22.73	Not sampled. No product observed.					-
	Well decommissioned on May 3, 2012							
MW-29	10/20/2009	15.14	ND	ND	ND	ND	-	
	4/27/2010	14.79	0.000720	0.0217	ND	ND	-	
	9/2/2110	14.30	ND	ND	ND	ND	-	
	5/5/2011	15.05	ND	0.000640 J	ND	ND	-	
	9/15/2011	15.70	0.000186 J	0.00434	ND	0.269 J	-	
	4/17/2012	12.96	NS	NS	NS	NS	NS	
	Well decommissioned on May 3, 2012							

Key provided on Page 7.

TABLE 6 - HISTORICAL GROUNDWATER DATA

Well No.	Sample Date	Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)					
			Benzene	Total BTEX	GRO	DRO	RRO	
MW-30	9/15/2011#	20.68	0.02 foot of product observed, not sampled					-
	4/17/2012	20.70	Not sampled. No product observed.					
	9/24/2012	19.32	Not sampled. No product observed.					
	1/3/2013~	19.24	0.266	17.7	33.9	1.51	ND	
	9/17/2013	20.03	Not sampled. No product observed.					
	8/25/2014	19.93	Not sampled. No product observed.					
	8/18/2015	22.16	Not sampled. No product observed.					
	9/20/2016	20.90	Not sampled. No product observed.					
MW-31	7/22/2011~	23.07	0.0567	2.13	7.35	0.643	ND	
	9/14/2011	21.86	0.0259	0.0712	1.27	0.431 J	-	
	4/17/2012	21.73	ND	ND	0.0478 J	ND	-	
	9/26/2012	20.38	ND	ND	ND	ND	ND	
	1/3/2013	20.60	0.00640	1.01	-	-	-	
	9/18/2013	21.33	0.0367	1.80	5.88	0.601	-	
	8/26/2014	21.50	0.0326	1.78 J	4.81	0.324 J	-	
	8/20/2015	23.57	0.0650	1.06	3.28	0.758	-	
	9/20/2016	22.24	0.112	1.65	4.66	0.995 B	-	
	MW-32	7/22/2011	23.89	ND	ND	ND	ND	ND
9/14/2011		22.63	0.000447 J	0.0149	0.0498 J	ND	-	
4/17/2013		22.48	ND	ND	ND	ND	ND	
6/26/2012		21.13	ND	ND	ND	ND	ND	
1/3/2013		21.36	ND	0.00383 J	-	-	-	
9/18/2013		22.02	ND	ND	0.0327 J	ND	-	
8/26/2014		22.26	ND	ND	ND	ND	-	
8/18/2015		24.23	ND	ND	ND	ND	-	
9/20/2016		22.95	ND	0.00247 J	ND	ND	-	
MW-33	7/21/2011	23.60	ND	ND	ND	ND	ND	
	9/15/2011	22.64	0.000265 J	0.0158	0.0498 J	0.200 J	-	
	4/18/2012	22.67	0.000200 J	0.000810 J	ND	0.247 J	ND	
	9/26/2012	21.51	ND	0.000880 J	ND	ND	ND	
	9/18/2013	22.56	ND	ND	ND	ND	-	
	8/26/2014	22.14	ND	ND	ND	ND	-	
	Well Decommissioned on June 26, 2015							
MW-34	7/21/2011	23.57	ND	ND	ND	ND	ND	
	9/15/2011	22.54	0.000183 J	0.0206	0.0548 J	0.276 J	-	
	4/18/2012	22.37	0.000150 J	0.000150 J	ND	ND	0.155 J	
	9/26/2012	20.98	ND	ND	ND	ND	ND	
	9/18/2013	12.69***	ND	ND	ND	ND	-	
	8/26/2014	21.84	ND	ND	ND	ND	-	
	Well Decommissioned on June 26, 2015							
MW-35	9/2/2011	20.26	ND	ND	ND	ND	ND	
	4/18/2012	20.13	0.000130 J	0.000560 J	ND	ND	ND	
	9/25/2012	18.79	ND	ND	ND	ND	ND	
	9/17/2013	19.32	ND	ND	ND	ND	-	
	8/25/2014	20.33	ND	ND	ND	ND	-	
	8/18/2015	20.98	ND	ND	0.0379 J	ND	-	
	9/20/2016	Assumed destroyed by road improvement project conducted in 2016.						-

Key provided on Page 7.

TABLE 6 - HISTORICAL GROUNDWATER DATA

Well No.	Sample Date	Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)				
			Benzene	Total BTEX	GRO	DRO	RRO
MW-36	4/18/2012	22.93	ND	ND	ND	0.310 J	0.340 J
	9/25/2012	21.50	ND	ND	ND	ND	ND
	9/17/2013	22.04	ND	ND	0.0401 J	ND	-
	8/25/2014	23.04	ND	ND	ND	ND	-
	8/18/2015	23.67	ND	0.00102 J	0.0386 J	ND	-
	9/20/2016	Assumed destroyed by road improvement project conducted in 2016.					
MW-37	9/26/2012	17.28	ND	ND	ND	ND	ND
	9/18/2013	14.45	ND	ND	ND	ND	-
	8/26/2014	13.75	ND	ND	ND	ND	-
		Well Decommissioned on June 26, 2015					
MW-38	9/26/2012	15.35	ND	ND	ND	ND	ND
	9/18/2013	15.99	ND	ND	ND	0.250 J	-
	8/26/2014	16.86	ND	ND	ND	ND	-
		Well Decommissioned on June 26, 2015					
MW-39	7/1/2014	20.14	ND	ND	ND	ND	0.186 J
	8/26/2014	21.84	ND	ND	ND	ND	-
	8/18/2015	22.03	ND	ND	0.0477 J	ND	-
	9/20/2016	20.62	ND	0.00236 J	0.0437 J	ND	-
MW-40	6/26/2014~	24.91	0.00283	0.00283	ND	ND	0.163 J
	8/26/2014	25.35	0.00401	0.00401	ND	ND	-
	8/20/2015	26.01	<b>0.0230</b>	0.0233	0.0903 J	ND	-
	9/20/2016	Could not access well.					
MW-41	6/26/2014	26.34	ND	ND	ND	ND	ND
	8/26/2014	26.73	ND	ND	ND	ND	-
	8/20/2015	27.29	ND	0.00154	0.0498 J	ND	-
	9/20/2016	Assumed destroyed by road improvement project conducted in 2016.					
MW-42	8/20/2015	28.25	<b>1.65</b>	16.5	<b>28.9</b>	1.26	ND
	9/20/2016	27.17	<b>1.16</b>	11.4	<b>18.8</b>	1.31 B	-
	7/28/2020	26.97	<b>0.114</b>	1.32	<b>2.93</b>	<b>1.56</b>	0.183 J
MW-43	8/20/2015	27.39	0.000190 J	0.00394	0.0507 J	ND	ND
	9/20/2016	Assumed destroyed by road improvement project conducted in 2016.					
MW-44	8/20/2015	25.52	ND	0.00119	0.0518 J	ND	ND
	9/20/2016	Assumed destroyed by road improvement project conducted in 2016.					
MW-45	7/28/2020	26.81	0.000240 J	0.000610 J	ND	0.212 J	0.173 J
MW-46	7/28/2020	25.53	<b>0.239</b>	0.501 J	1.21 J+	0.333 J	0.215 J
MW-47	7/28/2020	22.39	0.000190 J	0.000190 J	ND	ND	ND
MW-48	7/28/2020	21.12	ND	ND	ND	ND	ND
MW-49	7/28/2020	21.85	ND	ND	ND	0.276 J	0.243 J

Key provided on Page 7.

TABLE 6 - HISTORICAL GROUNDWATER DATA

Well No.	Sample Date	Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)					
			Benzene	Total BTEX	GRO	DRO	RRO	
B5MW	4/4/2006	26.49	17.7	119.3	230	3.46	-	
	9/26/2006	24.48	-	-	29.2	2.77	-	
	4/27/2007	25.09	0.937	14.9	30.7	4.58	-	
	10/4/2007	25.61	1.49	30.6	63.7	5.33	-	
	4/29/2008	24.45	1.13	13.3	34.3	3.09	-	
	9/16/2008	24.44	1.68	19.8	41.7	1.68	-	
	5/11/2009	25.62	1.64	18.5	36.7	3.43	-	
	9/28/2009	25.89	5.47	37.8	75.8	2.05	-	
	4/27/2010	25.80	Sample not analyzed					
	9/2/2010	24.76	2.34	17.8	40.3	2.65	-	
	9/14/2011	24.97	4.90	29.4	57.5	3.14	-	
	4/18/2012	24.87	23.1	98.9	-	-	-	
	9/24/2012	23.61	Not sampled. No product observed.					
	9/17/2013	24.66	Not sampled. No product observed.					
	8/18/2015	26.51	Not sampled. No product observed.					
9/20/2016	25.60	Not sampled. No product observed.						
B6MW	4/11/2006	27.22	ND	ND	-	-	-	
	4/12/2006	28.22	ND	ND	-	-	-	
Sampling suspended due to consistently low or ND results Assumed destroyed by road improvement project conducted in 2013.								
B8MW	4/30/2007	19.83	ND	ND	ND	ND	-	
	4/28/2008	19.43	ND	0.00762	ND	ND	-	
	9/16/2008	19.28	ND	ND	ND	ND	-	
	5/11/2009	20.34	ND	0.000818 J	ND	ND	-	
	9/28/2008	Well not sampled due to site access limitation						
	2010	Well not sampled due to site access limitation						
	7/22/2011	20.71	1.51	16.79	32.9	0.420 J	ND	
	9/14/2011	19.53	ND	0.000903	ND	ND	-	
4/17/2012	19.38	ND	0.000510 J	0.0546 J	ND	-		
Well decommissioned on May 3, 2012								
B13MW	6/2/2008	24.30	ND	ND	-	-	10.2	
	9/16/2008	24.00	ND	ND	-	-	8.64	
	5/11/2009	25.12	ND	0.00138 J	-	-	7.79	
	9/28/2009	25.38	ND	ND	-	-	1.97	
	4/27/2010	25.00	0.00104	0.0379	-	-	2.90	
	9/2/2010	24.21	ND	ND	-	-	2.47	
	5/5/2011	24.48	ND	ND	-	-	0.623	
	9/14/2011	24.44	ND	0.00543	-	-	6.25	
	4/18/2012	24.33	ND	ND	-	-	2.76	
	9/26/2012	23.27	-	-	-	-	0.987	
	9/18/2013	24.30	-	-	-	-	4.31	
	Assumed destroyed during Tesoro construction in 2013/2014.							

Key provided on Page 7.

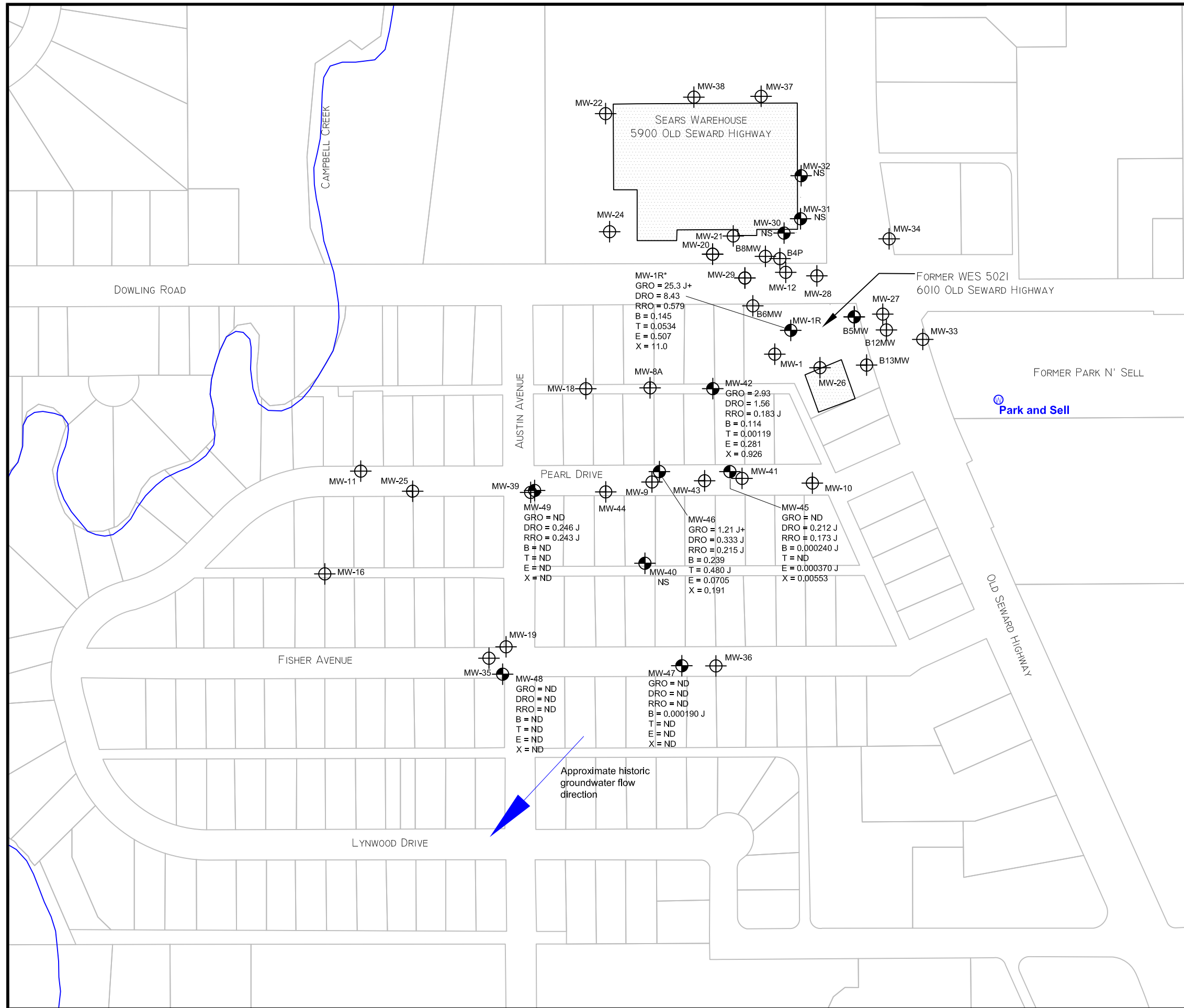
**TABLE 6 - HISTORICAL GROUNDWATER DATA**

Sample Date		Groundwater Depth^ (ft)	Target Analyte Concentrations* (mg/L)					
			Benzene	Total BTEX	GRO	DRO	RRO	
B4P†	12/18/2007	20.18	<b>8.98</b>	114.3	<b>174</b>	<b>6.43</b>	-	
	4/29/2008	20.46	<b>4.49</b>	69.9	<b>120</b>	<b>1.72</b>	-	
	9/16/2008	20.25	<b>2.12</b>	28.2	<b>47.1</b>	0.961	-	
	5/11/2009	21.29	<b>9.93</b>	96.0	<b>170</b>	<b>3.15</b>	-	
	9/28/2009	Well not sampled due to site access limitation						
	2010	Well not sampled due to site access limitation						
	7/22/2011	21.72	<b>8.18</b>	99.41	<b>193</b>	<b>2.20</b>	ND	
	9/14/2011	20.55	<b>8.17</b>	126	<b>180</b>	<b>6.32</b>	-	
	4/17/2012	20.43	Not sampled. No product observed.					
		Well decommissioned on May 3, 2012						
Former Park n' Sell Water Well	12/12/2008	-	ND	ND	ND	ND	ND	
	12/22/2009	-	ND	ND	ND	ND	ND	
	9/23/2011	-	ND	ND	ND	ND	<b>1.38</b>	
	12/15/2011	-	ND**	ND**	ND**	ND**	ND**	
	9/28/2012	-	ND	ND	ND	ND	ND	
	9/19/2013	-	ND	ND	ND	ND	ND	
	8/22/2014	-	ND	ND	ND	ND	ND	
	8/20/2015	Well not sampled; the parcel is currently unoccupied.						
	9/20/2016	Well assumed destroyed by construction activities.						

**KEY**

**DESCRIPTION**

- \* See Appendix E for compounds tested, methods, and laboratory reporting limits
- \*\* Identical results reported for sample run before and after silica-gel filtering
- Measurement not recorded or not applicable
- ^ Depth of static groundwater level below the measuring point or top of casing
- \*\*\* Potential error during recording measurement in the field
- ND Not detected
- NS Not sampled
- 8.98** Analyte concentration exceeds current cleanup criterion (0.0046 ppm benzene, 2.2 ppm GRO, 1.5 ppm DRO, and 1.1 ppm RRO) by 18 AAC 75.345 (October 2018)
- J Estimated concentration detected below the reporting limit
- ~ Listed value based on highest concentrations in duplicate set
- # Free product observed
- E Value is based on an estimated concentration of toluene above the calibration range
- mg/L milligrams per liter
- ft feet
- † Well B8MW and Piezometer B4P were both sampled in the 2008 and 2009 groundwater monitoring events. Based on historical data for Well B8MW, it was speculated that samples were inadvertently collected from Piezometer B4P in 2004 and 2007 but incorrectly attributed to Well B8MW. These results are now listed under Piezometer B4P.
- B Analyte concentration potentially affected by method blank contamination. See the ADEC Laboratory Data Review Checklist for details.

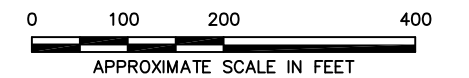


**LEGEND**

- Approximate location of Monitoring Well MW-32
- Approximate location of former Monitoring Well MW-12 (well was decommissioned, destroyed, or could not be located during the most recent sampling event)
- Approximate Location of Former Drinking Water Well
- ND Not Detected
- NS Not Sampled
- GRO Gasoline Range Organics (mg/L)
- DRO Diesel Range Organics (mg/L)
- RRO Residual Range Organics (mg/L)
- B Benzene (mg/L)
- T Toluene (mg/L)
- E Ethylbenzene (mg/L)
- X Total Xylenes (mg/L)
- \* The higher analytical results of a duplicate sample set.

**Notes:**

Existing and select former wells are presented on this figure. Samples were collected on July 28, 2020. Flagged analytical results, including J and J+ are defined on Table 5.



6010 OLD SEWARD HIGHWAY  
ANCHORAGE, ALASKA

**SITE PLAN**

SEPTEMBER 2020

101293-001



FIG. 1



**APPENDIX A**  
**SITE PHOTOGRAPHS**

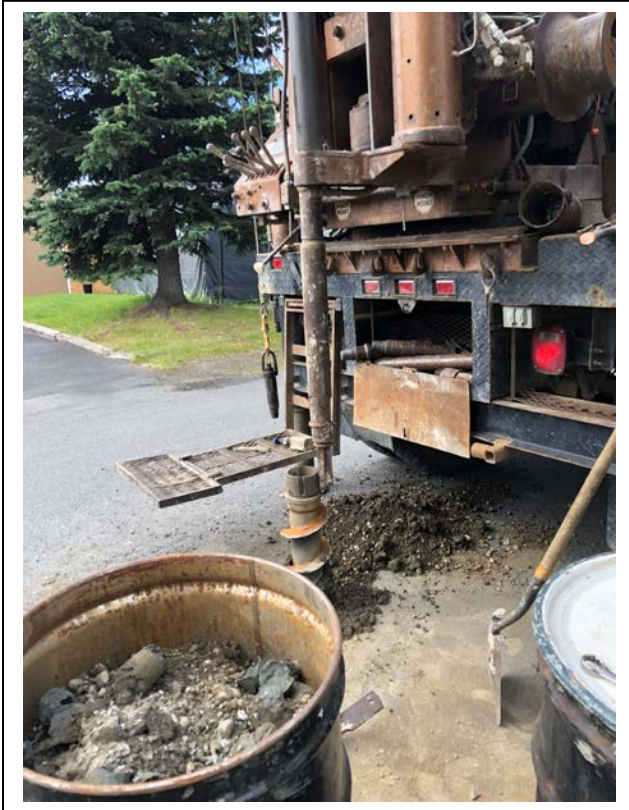


Photo 1: Looking southwest at the advancement of Boring B-45. (June 30, 2020)



Photo 2: Looking south during the installation of Monitoring Well MW-45. (June 30, 2020)

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Anchorage, Alaska

**PHOTOS 1 AND 2**

September 2020

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A-1

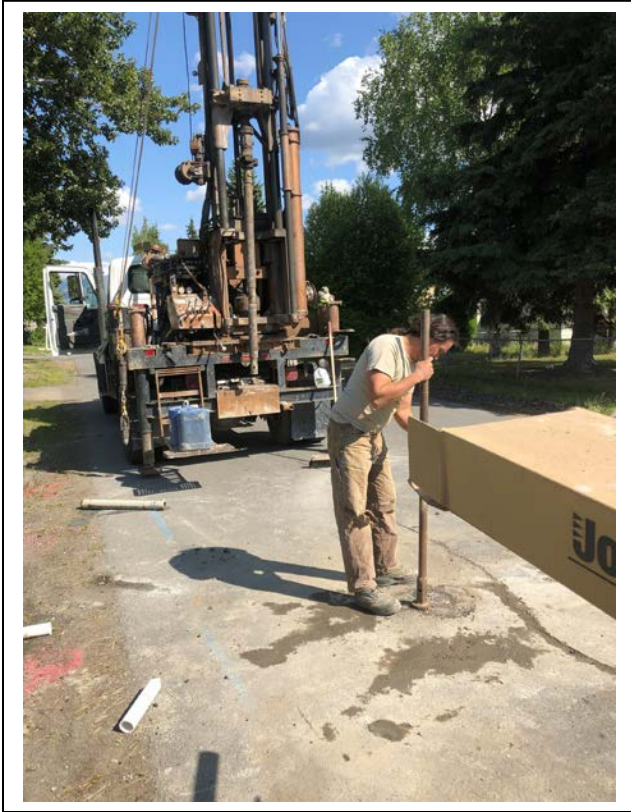


Photo 3: Looking southeast at the installation of Monitoring Well MW-46. (June 30, 2020)

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Anchorage, Alaska

**PHOTO 3**

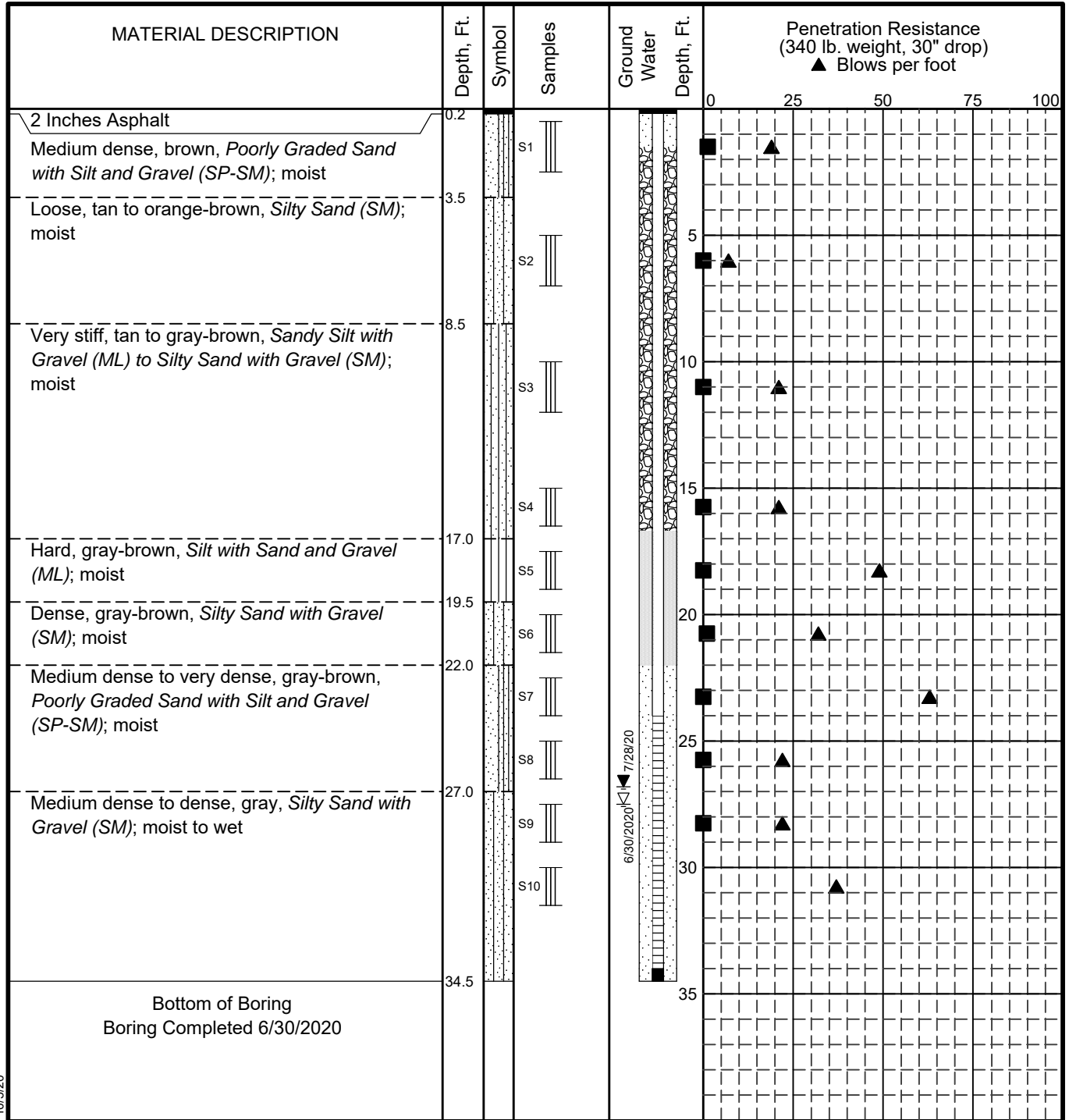
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A-2

**APPENDIX B**  
**BORING LOGS**  
**AND**  
**WELL CONSTRUCTION DETAILS**



**LEGEND**

- \* Sample not recovered
- III 3" O.D. Split Spoon Sample
- ▽ Ground Water Level At Time Of Drilling
- ▼ Static Water Level
- ▨ Solid Casing, Sand Pack
- ▩ Solid Casing and Annular Seal
- ▧ Slotted Section, Filter Sand
- ▦ Solid Casing, Cuttings Backfill

**NOTES**

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.
4. USC letter symbol based on visual classification.

■ PID Reading (ppm)

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**LOG OF BORING B-45**

September 2020

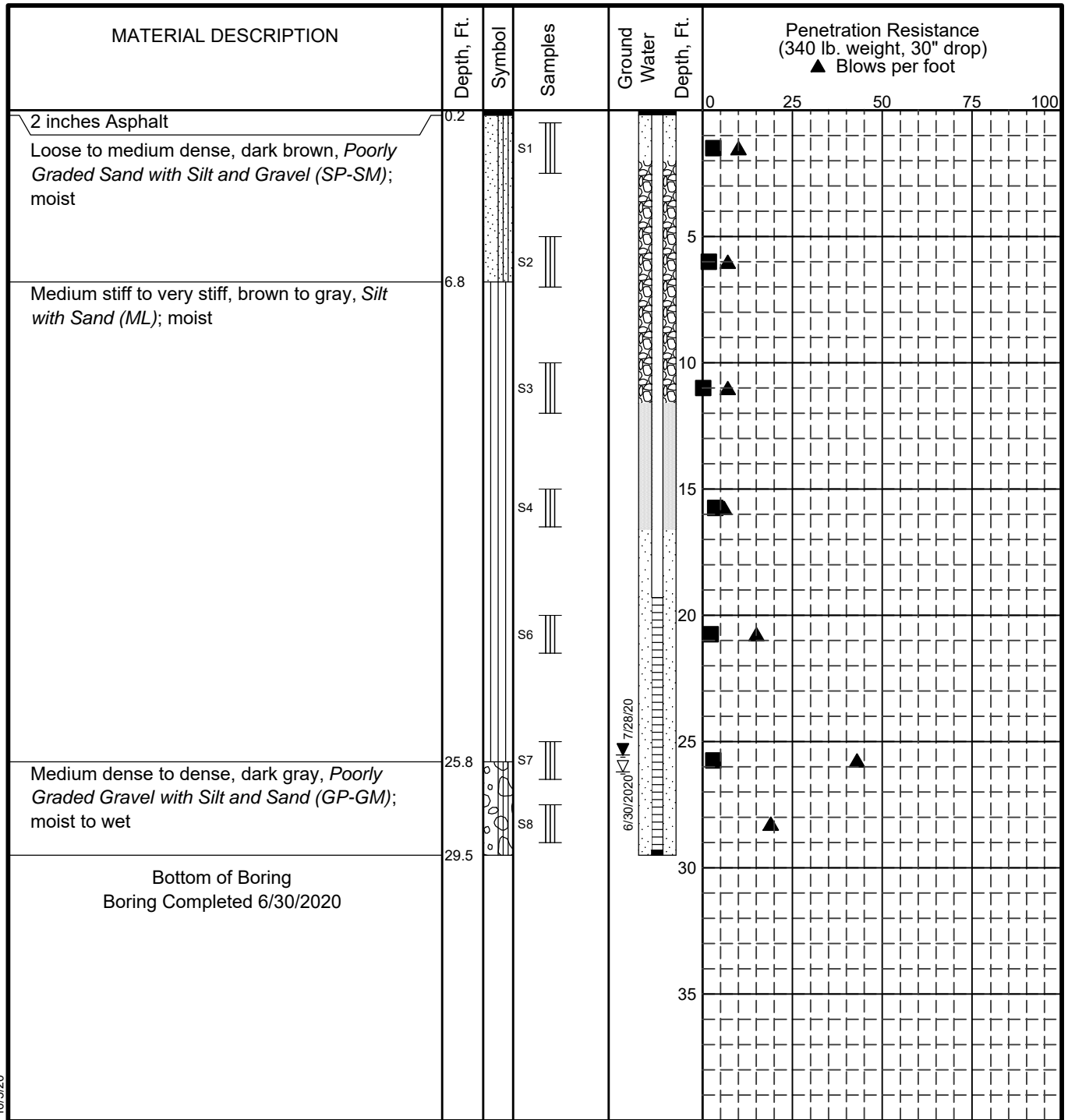
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**FIG. B-1**

ENVIRONMENTAL LOG GINT TEMPLATE7.GPJ S&W GEO1.GDT 10/5/20

ENVIRONMENTAL LOG GINT TEMPLATE7.GPJ S&W GEO1.GDT 10/5/20



**LEGEND**

- \* Sample not recovered
- III 3" O.D. Split Spoon Sample
- ▽ Ground Water Level At Time Of Drilling
- ▼ Static Water Level
- Solid Casing, Sand Pack
- Solid Casing and Annular Seal
- Slotted Section, Filter Sand
- Solid Casing, Cuttings Backfill

**NOTES**

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.
4. USC letter symbol based on visual classification.

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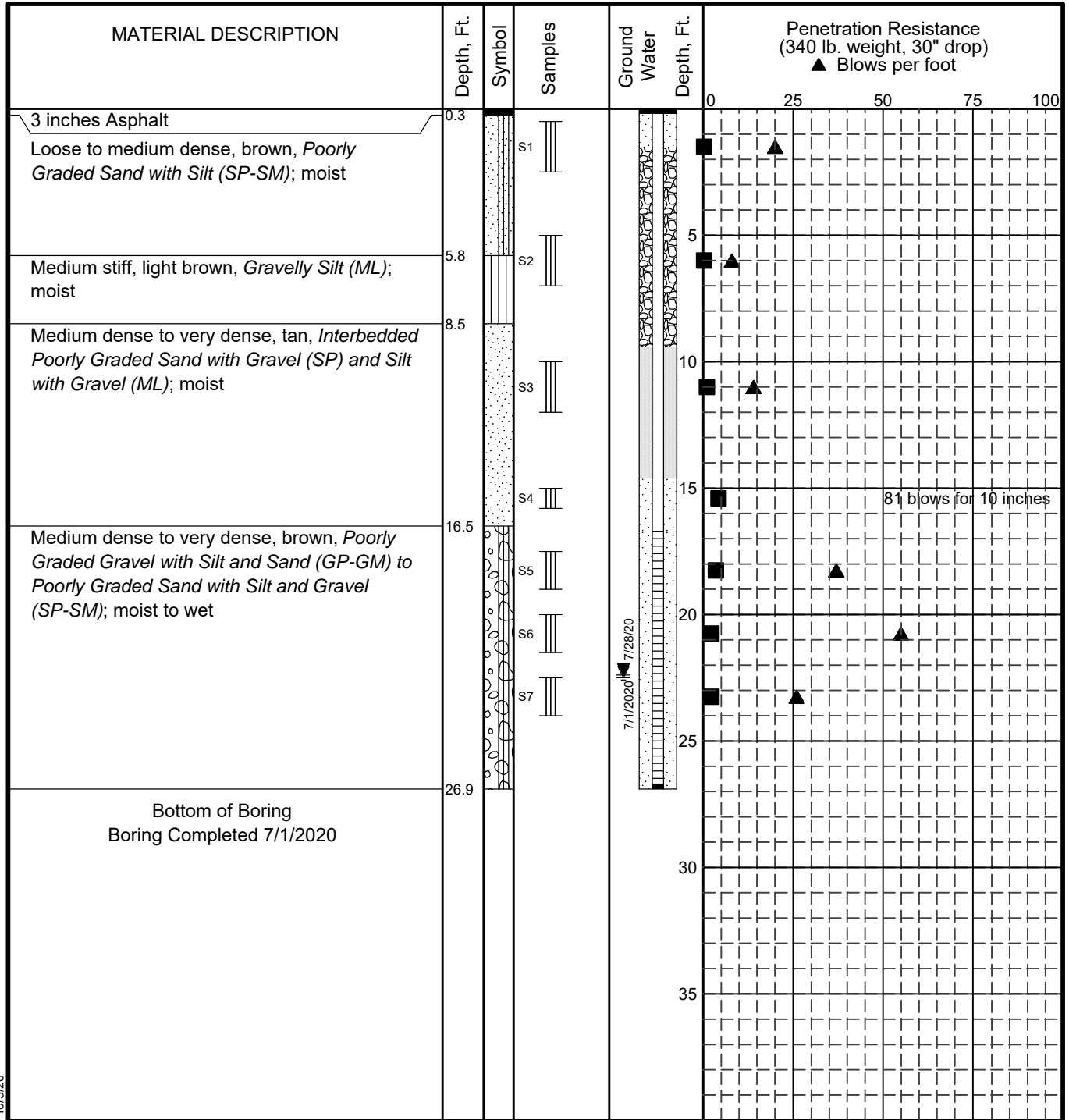
**LOG OF BORING B-46**

September 2020

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**FIG. B-2**



**LEGEND**

- \* Sample not recovered
- III 3" O.D. Split Spoon Sample
- ▽ Ground Water Level At Time Of Drilling
- ▼ Static Water Level
- Solid Casing, Sand Pack
- Solid Casing and Annular Seal
- Slotted Section, Filter Sand
- Solid Casing, Cuttings Backfill

**NOTES**

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

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Anchorage, Alaska

**LOG OF BORING B-47**

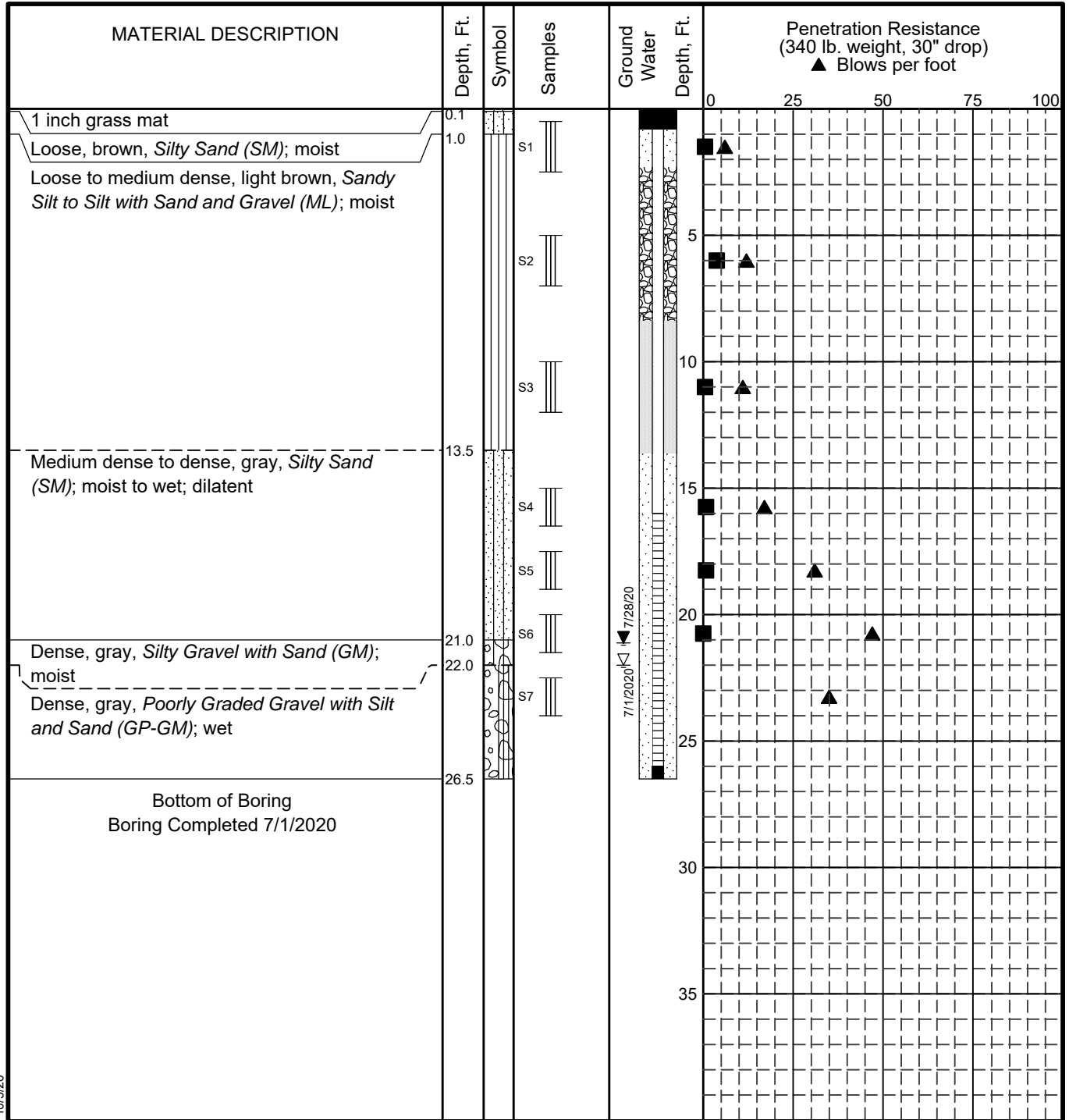
September 2020

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**FIG. B-3**

ENVIRONMENTAL LOG GINT TEMPLATE7.GPJ S&W GEO1.GDT 10/5/20



**LEGEND**

- \* Sample not recovered
- III 3" O.D. Split Spoon Sample
- ▽ Ground Water Level At Time Of Drilling
- ▼ Static Water Level
- ▨ Solid Casing, Sand Pack
- ▩ Solid Casing and Annular Seal
- ▧ Slotted Section, Filter Sand
- ▦ Solid Casing, Cuttings Backfill

**NOTES**

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

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Anchorage, Alaska

**LOG OF BORING B-48**

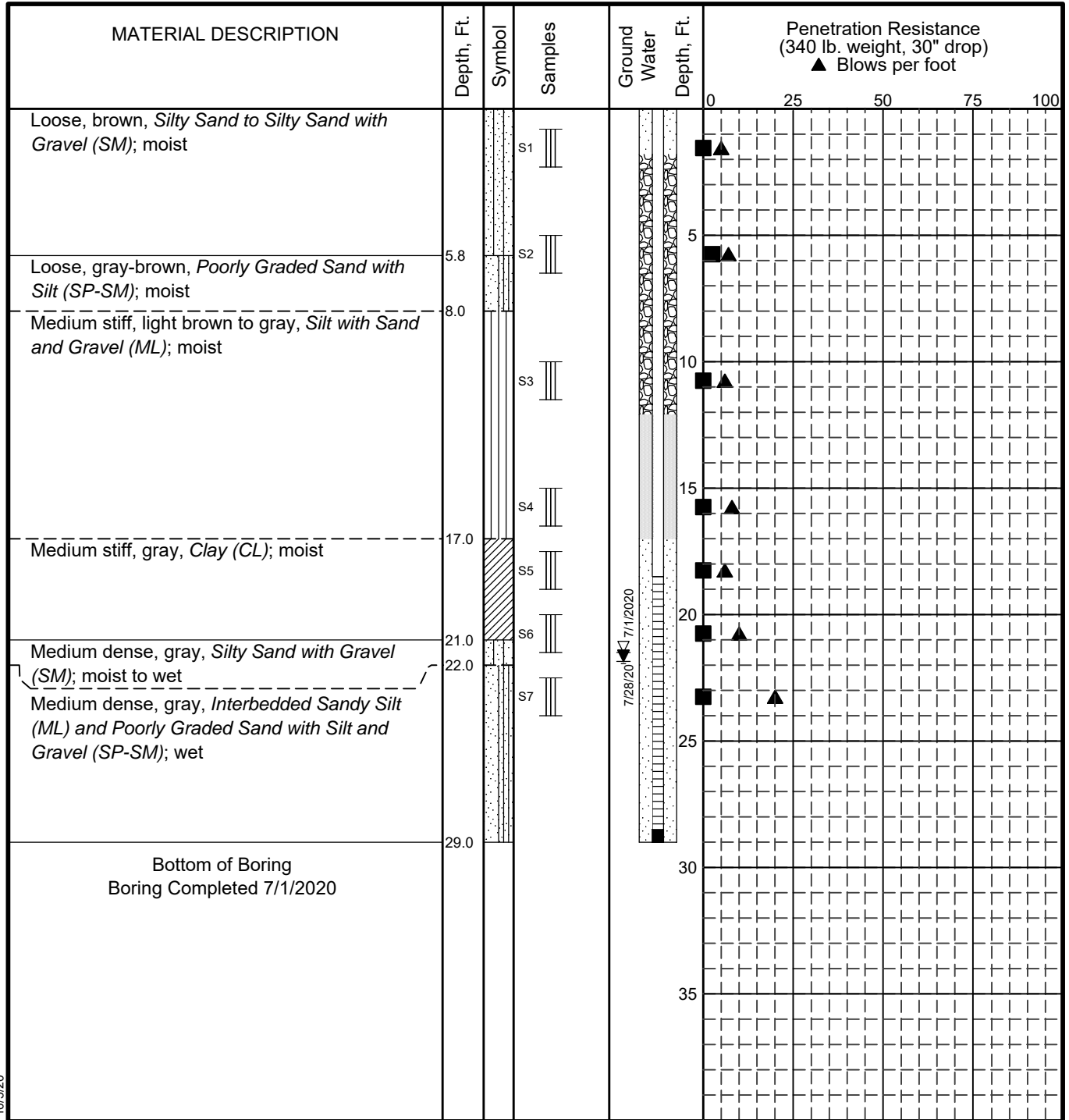
September 2020

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**FIG. B-4**





**LEGEND**

- \* Sample not recovered
- III 3" O.D. Split Spoon Sample
- [Symbol] Ground Water Level At Time Of Drilling
- [Symbol] Static Water Level
- [Symbol] Solid Casing, Sand Pack
- [Symbol] Solid Casing and Annular Seal
- [Symbol] Slotted Section, Filter Sand
- [Symbol] Solid Casing, Cuttings Backfill

**NOTES**

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

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Anchorage, Alaska

**LOG OF BORING B-49**

September 2020

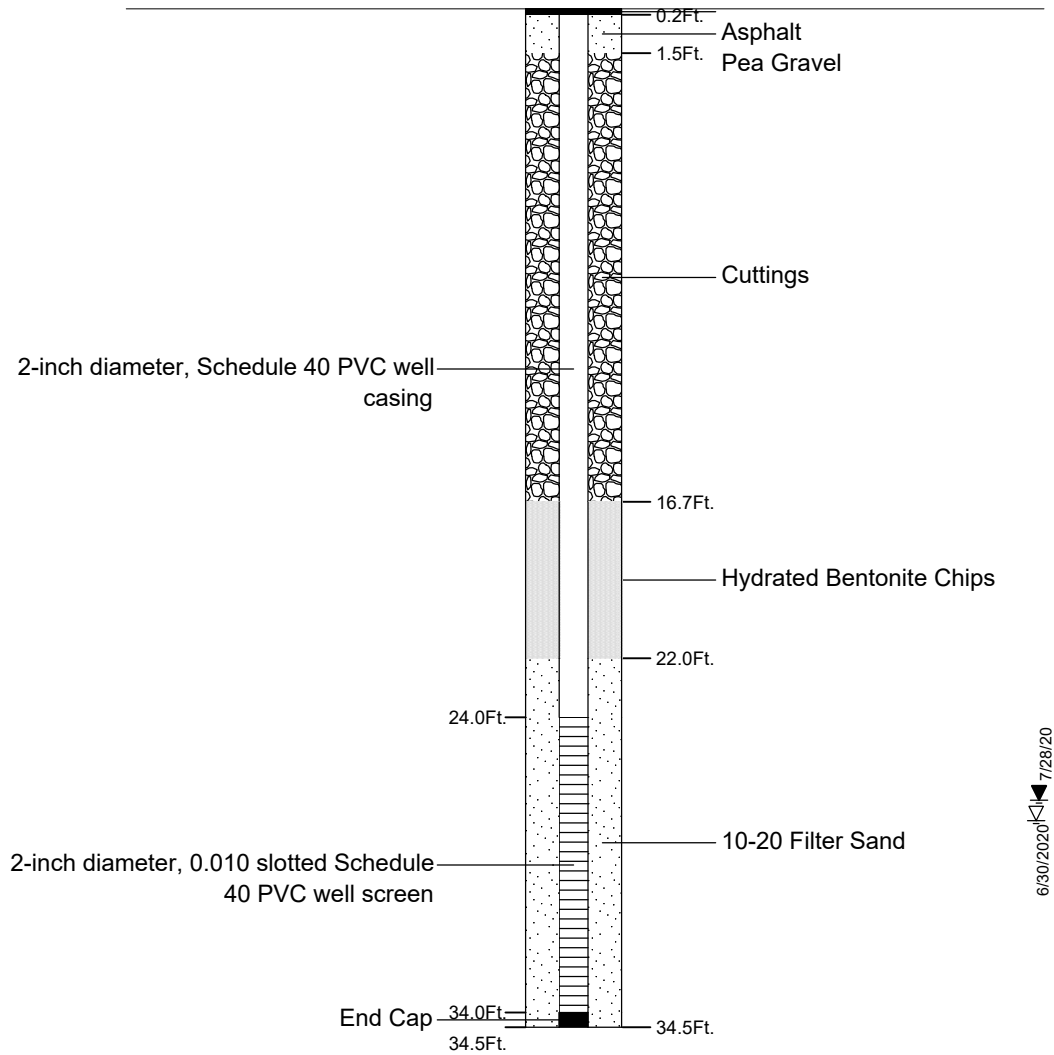
101293-001

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**FIG. B-5**

**Casing Description**


**Backfill Description**



**LEGEND**

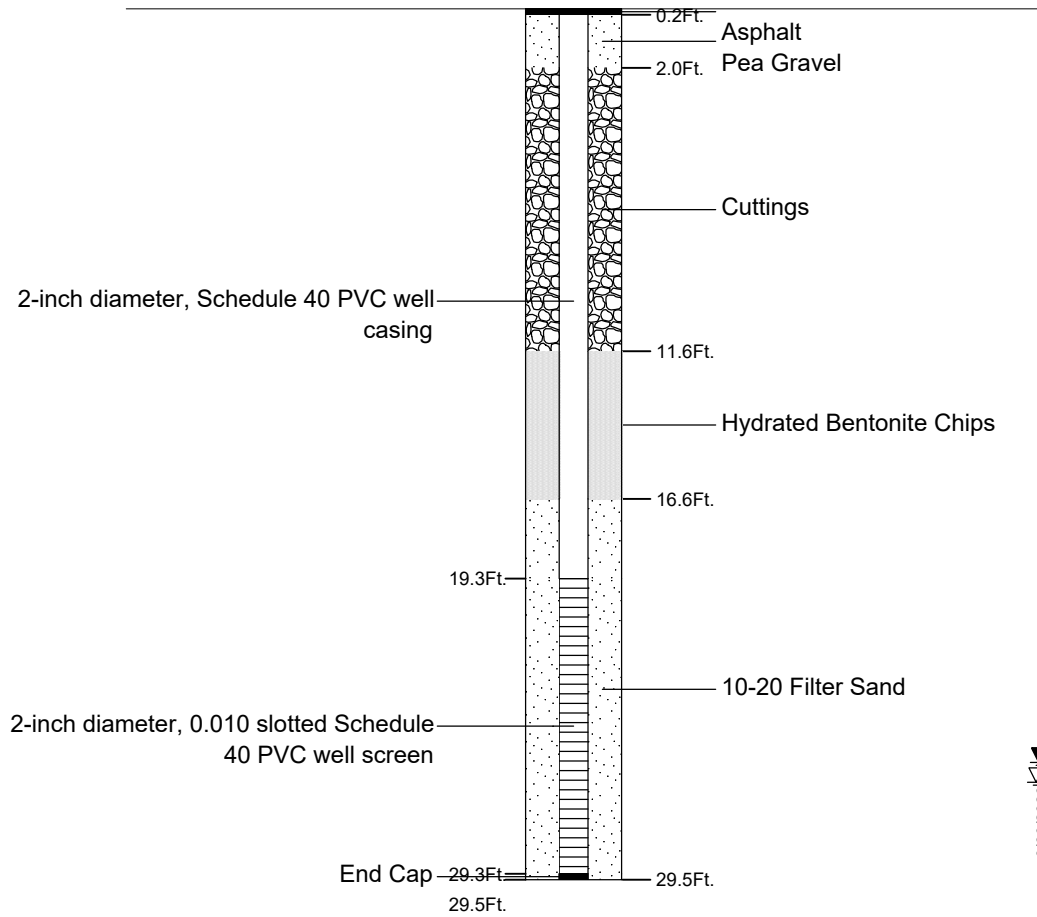
- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

6010 Old Seward Highway Anchorage, Alaska	
<b>MONITORING WELL MW-45 CONSTRUCTION DETAIL</b>	
September 2020	101293-001
 <b>SHANNON &amp; WILSON, INC.</b> Geotechnical and Environmental Consultants	<b>Fig. B-6</b>

**Casing Description**

**Backfill Description**




6/30/2020 7/28/20

**LEGEND**

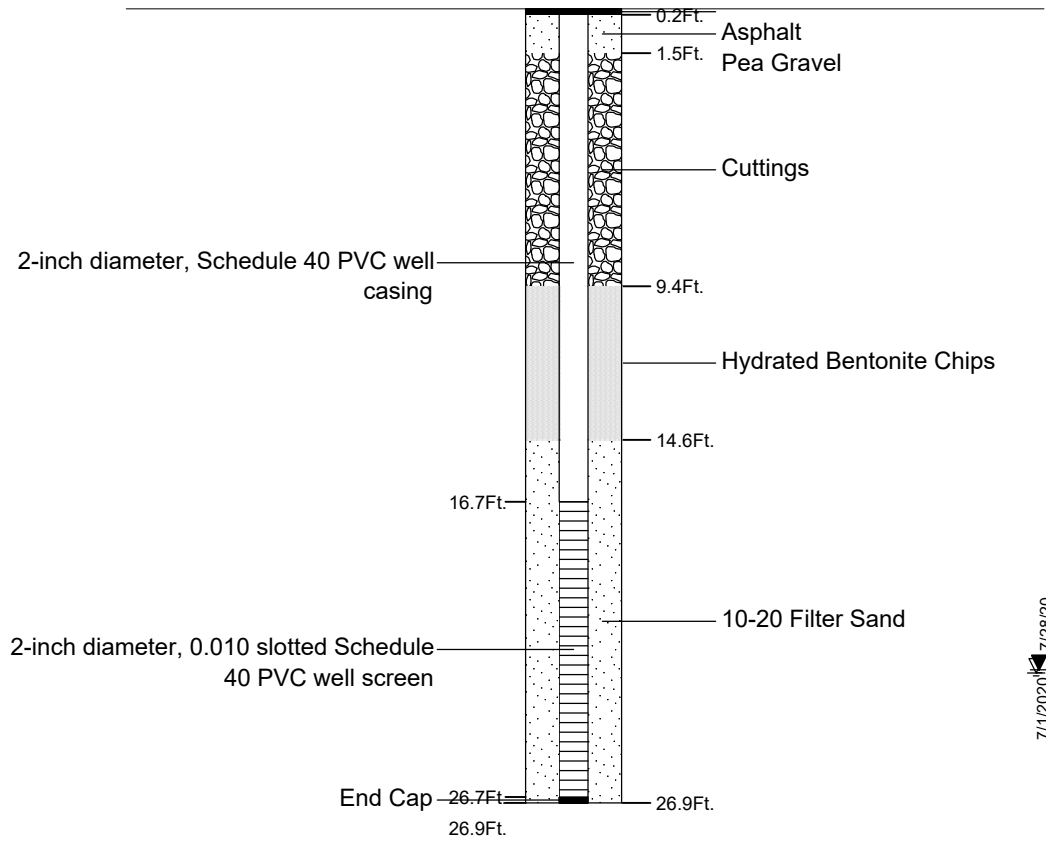
- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

6010 Old Seward Highway Anchorage, Alaska	
<b>MONITORING WELL MW-46 CONSTRUCTION DETAIL</b>	
September 2020	101293-001
 <b>SHANNON &amp; WILSON, INC.</b> Geotechnical and Environmental Consultants	<b>Fig. B-7</b>

**Casing Description**


**Backfill Description**



**LEGEND**

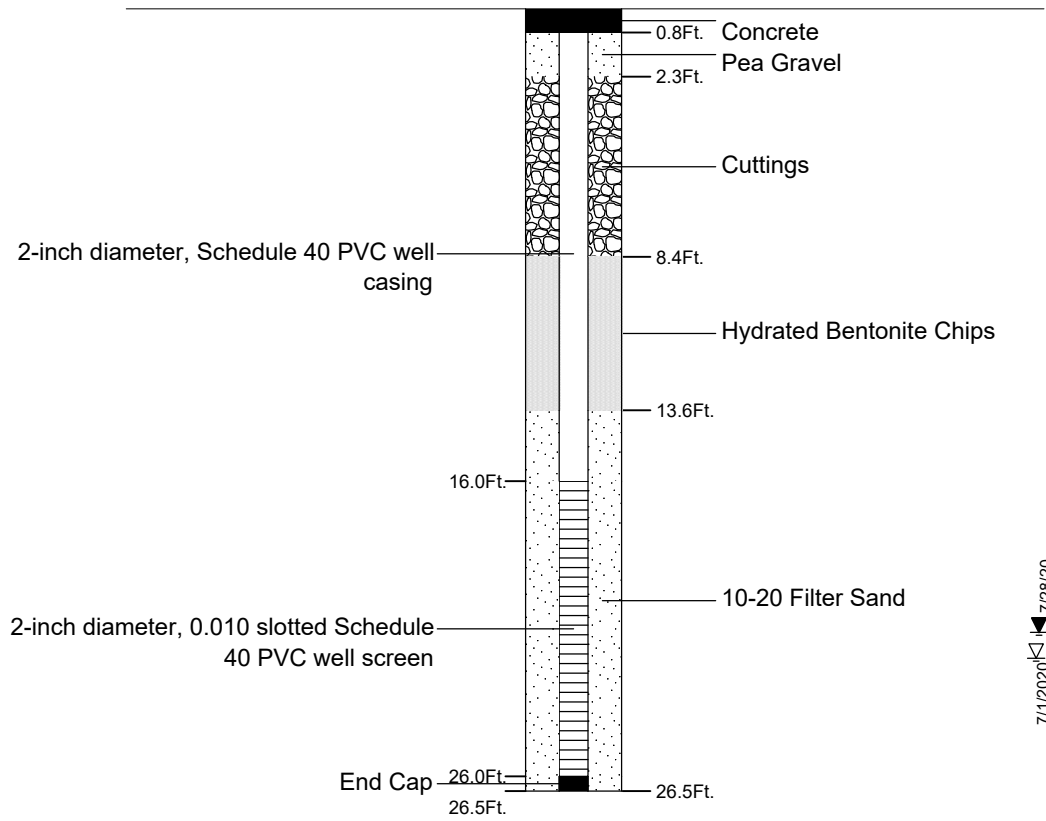
- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

6010 Old Seward Highway Anchorage, Alaska	
<b>MONITORING WELL MW-47 CONSTRUCTION DETAIL</b>	
September 2020	101293-001
 <b>SHANNON &amp; WILSON, INC.</b> Geotechnical and Environmental Consultants	<b>Fig. B-8</b>

**Casing Description**


**Backfill Description**



**LEGEND**

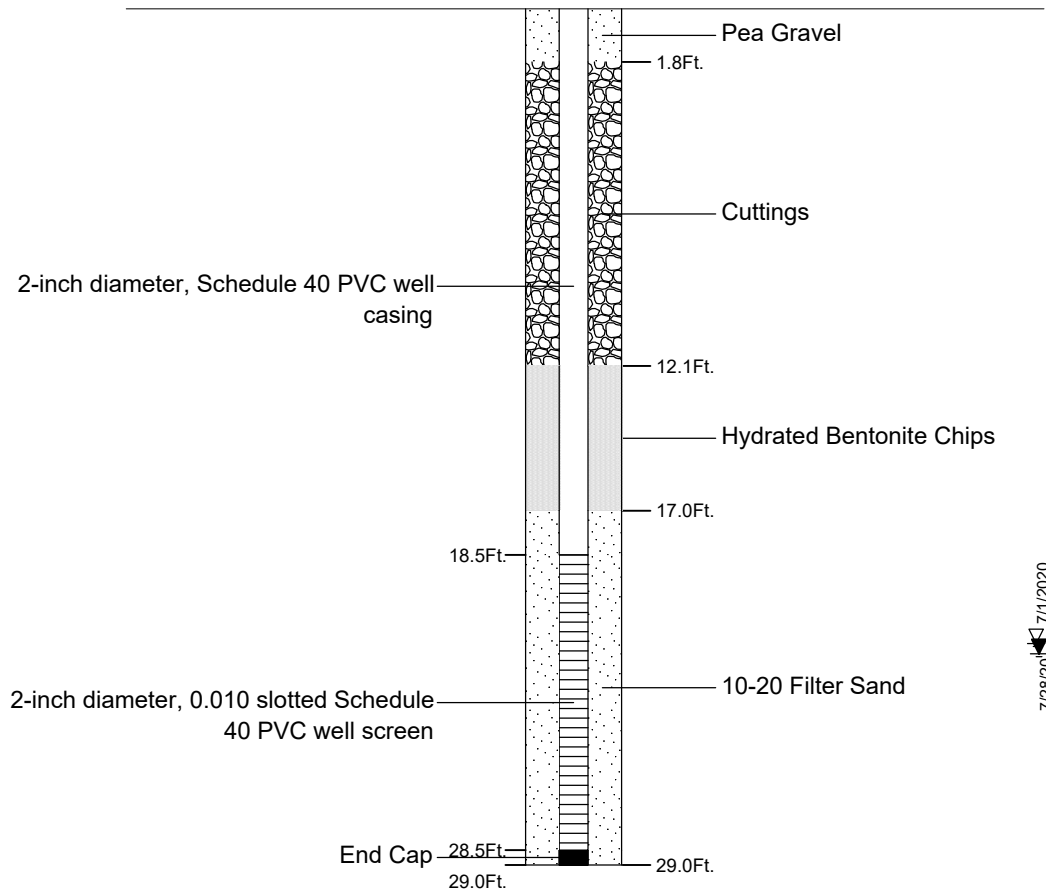
- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

6010 Old Seward Highway Anchorage, Alaska	
<b>MONITORING WELL MW-48 CONSTRUCTION DETAIL</b>	
September 2020	101293-001
 <b>SHANNON &amp; WILSON, INC.</b> Geotechnical and Environmental Consultants	<b>Fig. B-9</b>

**Casing Description**

**Backfill Description**



**LEGEND**

- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

6010 Old Seward Highway  
Anchorage, Alaska

**MONITORING WELL MW-49  
CONSTRUCTION DETAIL**

September 2020

101293-001

**SHANNON & WILSON, INC.**  
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**Fig. B-10**

**APPENDIX C**  
**FIELD NOTES**

# FIELD LOG OF BORING

**SHANNON & WILSON, INC.**  
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

BORING NO: MW45

JOB NO: 101293  
 JOB NAME: WES 5021  
 LOGGED BY: SKD  
 LOCATION: \_\_\_\_\_ ELEV.: \_\_\_\_\_  
 START DATE: 6/30 END DATE: \_\_\_\_\_  
 WEATHER DURING DRILLING: hot & sun

DRILL COMPANY/DRILLER: Disco / Daniel + Co  
 DRILL RIG EQUIPMENT: CME 75  
 DRILLING METHOD: HSA  
 HAMMER TYPE: Auto ROD TYPE/DIA.: \_\_\_\_\_  
 HAMMER WEIGHT: 340 HAMMER DROP: \_\_\_\_\_  
 CASING SIZE/TYPE: 4.25 ID HOLE SIZE: \_\_\_\_\_

### SAMPLE DATA

TIME DATE	SAMP. NO. TYPE	DEPTH TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REG. Env. Sample (Y/N)	DRILL ACTION	CONTACTS / GROUNDWATER	PID	CONST. %	FIELD IDENTIFICATION
									[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
9:17	1	0.5	12 (19)	1.5			0.5	G 40	brn PG sd w/ silt & gr, moist
	3SS	2.5	5	Y				S 50	
								F 10	
9:21	2	5	4 (34)	2.0			0	G	tan to org brn silty sd, moist
	3SS	7	4	Y				S 70	
								F 30	
9:29	3	10	6 (21)	2.0			0	G 30	tan silty sd w/ gr, moist
	3SS	12	8 (15)	Y				S 50	
								F 40	
9:36	4	15	5 (21)	2.0			0	G 15	gr brn sandy silt w/ gr, moist
	3SS	16.5	13	Y				S 30	
								F 55	
9:57	5	17.5	7 (49)	1.5			0	G 15	gr brn silt w/ sd & gr moist
	3SS	19	15 (34)	Y				S 15	
								F 70	
10:05	6	20	14 (32)	1.5			0	G 25	gr brn silty sd w/ gr, moist
	3SS	21.5	10 (22)	Y				S	
								F 30	
10:14	7	22.5	8 (63)	1.5			0	G 20	gr brn PG sd w/ silt & gr moist
	3SS	24	27 (36)	Y				S	
								F 5	

### SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
0	0.2		2" asphalt

COMMENTS (i.e. materials used, visitors, problems, etc.):  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### GROUNDWATER DATA

WATER DEPTH	TIME	DATE
17.5	10:31	6/30

### SUMMARY OF TIME AND FOOTAGE

FOOTAGE DRILLED: \_\_\_\_\_ SAMPLES: \_\_\_\_\_ Attempted  
 Recovered \_\_\_\_\_  
 DRILL/SAMPLE 9:14 hrs. STANDBY: \_\_\_\_\_ hrs.  
 SETUP/CLEANUP: \_\_\_\_\_ hrs. WELL INSTALL: \_\_\_\_\_ hrs.  
 OTHER: \_\_\_\_\_

BORING: MW45 SHEET 1 OF 2











DRILL COMPANY/DRILLER: <u>Disco / Daniel + Lo</u> DRILL RIG EQUIPMENT: <u>CME 75</u> DRILLING METHOD: <u>HSA</u> HAMMER TYPE: <u>340 Auto</u> ROD TYPE/DIA.: _____ HAMMER WEIGHT: <u>340</u> HAMMER DROP: _____ CASING SIZE/TYPE: <u>4.25 ID</u> HOLE SIZE: _____	JOB NO: <u>101293</u> BORING NO: <u>MW47</u> JOB NAME: <u>WES 5021</u> LOGGED BY: <u>SKD</u> LOCATION: _____ ELEV.: _____ START DATE: <u>7/1</u> END DATE: _____ WEATHER DURING DRILLING: <u>hot &amp; sunny</u>
--	---

**SAMPLE DATA**

TIME	SAMP. NO.	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	CONST.	FIELD IDENTIFICATION
DATE	TYPE	DEPTH	RESISTANCE	Env.	ACTION	GROUNDWATER		%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
		TO	BLOWS / 6 INCH	Sample (Y/N)					
8:31	1	0.5	5 10 10	(20) 2.0			0.1	G 10-15	brown PG sd w/ silt, moist
	3SS	2.5	8	Y				F 10	
8:39	2	5	7 4 4	(8) 1.8		5.8	0.1	G 30	AA to 5.8
	3SS	7	4	Y				S 10	gr w/over geotextile
								F 60	light brn, LP silt w/ gr, moist
8:50	3	10	4 4 10	(14) 1.8			0.4	G 30	tan interbedded PG sd & silt w/ gr
	3SS	12	9	Y				S 10	moist
								F 5	~4" sd next silt
9:01	4	15	31 50 4"	(81/100) 1.5			1.7	G	interbedded
	3SS	15.8		Y				S	AA but large gr w/ sds moist
								F	
9:16	5	17.5	13 17	(37) 1.2			1.4	G 45	brn PG sd w/ silt & gr, moist
	3SS	19	20	Y				S	
								F 5	
9:24	6	20	10 20	(55) 1.5			0.9	G 65	gr brn, PG gr w/ silt & sd moist
	3SS	21.5	35	Y				S	
								F 5	
9:36	7	22.5	9 13	(26) 1.5			0.9	G 55	gr brn PG gr w/ silt & sd wet
	3SS	24	13	Y but probably too wet				S	
								F 5	

**SUMMARY FIELD LOG OF BORING**

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
0	0.25		3" asphalt

COMMENTS (i.e. materials used, visitors, problems, etc.):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**GROUNDWATER DATA**

WATER DEPTH	TIME	DATE
22.5	9:36	7/1

**SUMMARY OF TIME AND FOOTAGE**

FOOTAGE \_\_\_\_\_ SAMPLES: \_\_\_\_\_ Attempted  
 DRILLED: \_\_\_\_\_ Recovered

DRILL/SAMPLE 9:27 hrs. STANDBY: \_\_\_\_\_ hrs.  
 SETUP/CLEANUP: \_\_\_\_\_ hrs. WELL INSTALL: \_\_\_\_\_ hrs.

OTHER: \_\_\_\_\_

BORING: MW47 SHEET 1 OF 1



DRILL COMPANY/DRILLER: <u>Disco/Daniel Hlo</u> DRILL RIG EQUIPMENT: <u>CME 75</u> DRILLING METHOD: <u>HSA</u> HAMMER TYPE: <u>Auto</u> ROD TYPE/DIA.: _____ HAMMER WEIGHT: <u>340#</u> HAMMER DROP: _____ CASING SIZE/TYPE: <u>4.25ID</u> HOLE SIZE: _____	JOB NO: <u>101293</u> BORING NO: <u>MW48</u> JOB NAME: <u>WES 5021</u> LOGGED BY: <u>SKD</u> LOCATION: _____ ELEV.: _____ START DATE: <u>7/1</u> END DATE: _____ WEATHER DURING DRILLING: <u>hot &amp; sunny</u>
---	---

SAMPLE DATA									
TIME	SAMP. NO.	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	CONST.	FIELD IDENTIFICATION
DATE	TYPE	DEPTH	RESISTANCE	Env.	ACTION	GROUNDWATER		%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
		TO	BLOWS / 6 INCH	Sample (Y/N)					
11:50	1	0.5	2 (6)	2.0		10	0.2	15	brn silty sd moist
7/1	355	2.5	24 4	Y				15	light brn silt w/ sd & gr moist
								70	
11:56	2	5	5 7 (12)	0.3			1.5	30	light brn sdy silt moist
	355	7	5 5	Y					
12:07	3	10	4 5 (11)	2.0			0.2	15	light brn IP silt w/ sd & gr moist
	355	12	5 6 8	Y				15	
12:17	4	15	4 7 (17)	1.5			0.3	60	grey dilatant silty sd, moist to wet
	355	16.5	10	Y				40	
12:30	5	17.5	10 14 (31)	1.5			0.3	70	grey dilatant fine sd to silty sd moist to wet
	355	19	17	Y				30	
12:39	6	20	10 20 (47)	1.5		21.0	0	45	grey dilatant fine sd to silty sd moist to wet
	355	21.5	27	Y				90	grey silty gr w/ sd moist
								125	
12:52	7	22.5	8 18 (35)	1.5					grey PL-gr w/ silt & sd wet
	355		17	N					

\*

SUMMARY FIELD LOG OF BORING				COMMENTS (i.e. materials used, visitors, problems, etc.):
DEPTH		USCS	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG	
FROM	TO	CLASSIF.		
				_____ _____ _____ _____ _____ _____ _____ _____ _____ _____

GROUNDWATER DATA		
WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE			
FOOTAGE DRILLED:	SAMPLES:	Attempted	Recovered
DRILL/SAMPLE <u>11:45</u> hrs.	STANDBY:	_____	_____
SETUP/CLEANUP: _____ hrs.	WELL INSTALL:	_____	_____
OTHER: _____			

BORING: <u>MW48</u>	SHEET <u>1</u> OF <u>1</u>
---------------------	----------------------------







# MONITORING WELL CONSTRUCTION DETAILS

Shannon & Wilson, Inc.

Job No: 101293 Project: WES 5021  
 Weather: nice, gentle breeze  
 Well No.: MW 45  
 Date: 6/30/20 Time Started: 11:22 Time Completed: 1:30

### WELL DATA:

Pipe Type: schedule 40 PVC  
 Diameter: 2"  
 Total Depth (ft bgs): 34.5' 34.5'  
 Well Screen Interval (feet): ~~23.6-33.6'~~ 24'-34'  
 Top of Well Screen (ft bgs): ~~23.6'~~ 24.0'  
 Slot size: 0.1"  
 Casing Connection: threaded  
 Depth below surface: 0.4' N/A   
 Casing stickup: \_\_\_\_\_ N/A

### PACKING MATERIAL:

	Depth below ground surface:	
	From	To
Soil Cuttings:	_____	_____
Sand (20-40):	_____	_____
Bentonite chips:	<u>16.7</u>	<u>22</u>
Sand ( <del>20-40</del> ):	<u>34</u>	<u>22</u>
	<u>10-20</u>	

### MONUMENT:

Flush Mount  Post   
 Monument height: \_\_\_\_\_ N/A   
 Monument Diameter: 6" N/A

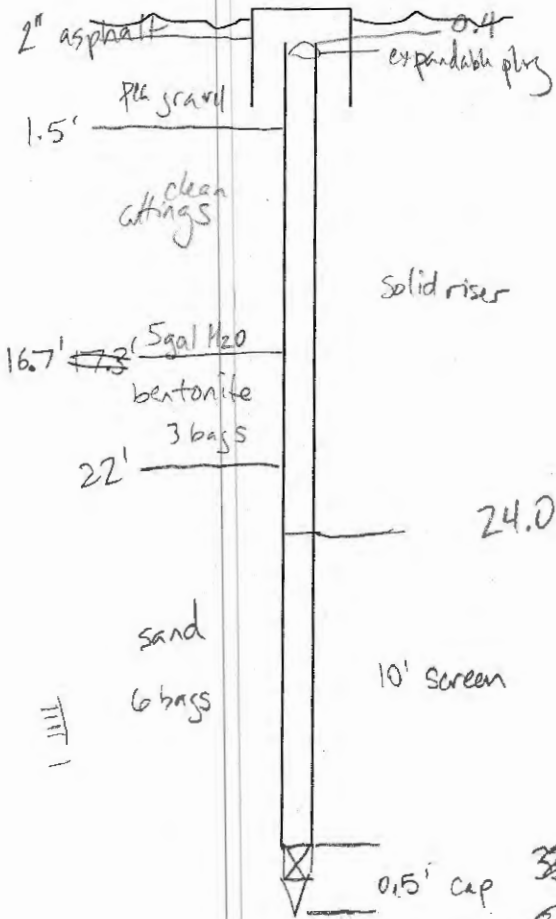
### LOCK:

Type: N/A  
 Combination: \_\_\_\_\_  
 Length cutoff last section: \_\_\_\_\_

Remarks: \_\_\_\_\_

Time between installation/development: \_\_\_\_\_

Engineer or Geologist: JKD



~~33.0'~~ 34.0'  
~~33.6'~~ 34.5'



Shannon & Wilson, Inc.

### MONITORING WELL CONSTRUCTION DETAILS

Job No: 101293 Project: Wes 5021  
 Weather: Partly Cloudy, slight breeze 65°  
 Well No.: MW46  
 Date: 6/30/20 Time Started: 3:25 Time Completed: 4:45 pm

#### WELL DATA:

Pipe Type: Schedule 40 pvc  
 Diameter: 2"  
 Total Depth (ft bgs): 29.5  
 Well Screen Interval (feet): 19.3-29.3  
 Top of Well Screen (ft bgs): 19.3  
 Slot size: 0.1"  
 Casing Connection: threaded  
 Depth below surface: 0.5 N/A   
 Casing stickup: \_\_\_\_\_ N/A

#### PACKING MATERIAL:

	Depth below ground surface:	
	From	To
Soil Cuttings:	<u>11.6</u>	<u>2.0</u>
Sand (20-40):		
Bentonite chips:	<u>16.6</u>	<u>11.6</u>
Sand ( <del>20-40</del> ):	<u>29.5</u>	<u>16.6</u>
	<u>10-20</u>	

#### MONUMENT:

Flush Mount  Post   
 Monument height: \_\_\_\_\_ N/A   
 Monument Diameter: 6" N/A

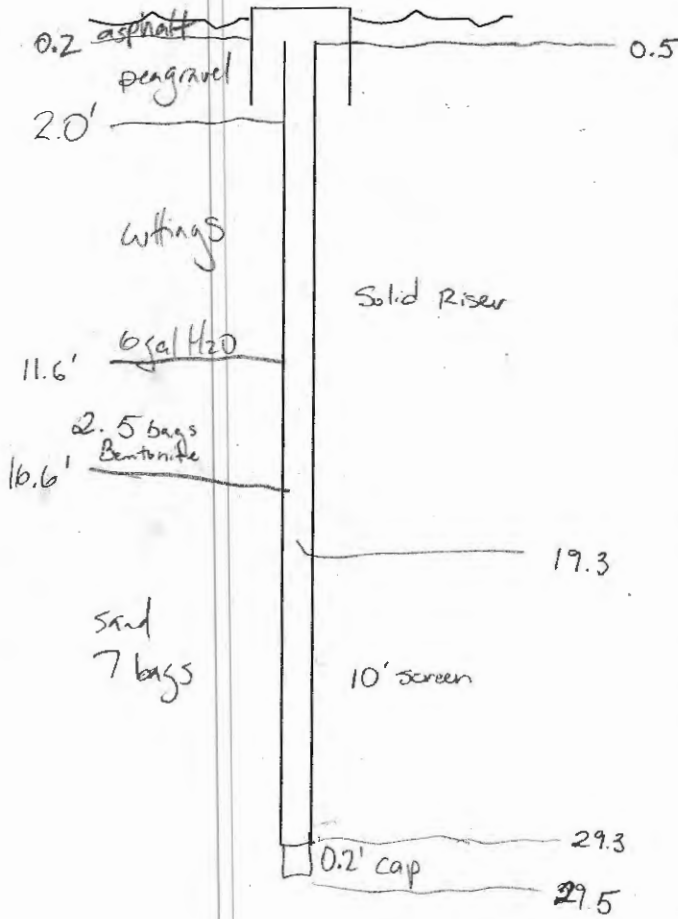
#### LOCK:

Type: N/A  
 Combination: \_\_\_\_\_  
 Length cutoff last section: \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Time between installation/development: \_\_\_\_\_

Engineer or Geologist: SKD







**MONITORING WELL CONSTRUCTION DETAILS**

Shannon & Wilson, Inc.

Job No: 101293 Project: WES 5021  
 Weather: sunny, light breeze  
 Well No.: MW47  
 Date: 7/1/2020 Time Started: 9:50 Time Completed: 11:30

**WELL DATA:**

Pipe Type: schedule 40 PVC  
 Diameter: 2"  
 Total Depth (ft bgs): 26.9'  
 Well Screen Interval (feet): 26.7-16.7'  
 Top of Well Screen (ft bgs): 16.7'  
 Slot size: 0.1"  
 Casing Connection: threaded  
 Depth below surface: 0.5' N/A   
 Casing stickup: \_\_\_\_\_ N/A

**PACKING MATERIAL:**

	Depth below ground surface:	
	From	To
Soil Cuttings:	<u>9.4</u>	<u>1.5</u>
Sand (20-40):		
Bentonite chips:	<u>14.6'</u>	<u>9.4</u>
Sand (20-40): 10-20	<u>26.9</u>	<u>14.6'</u>

**MONUMENT:**

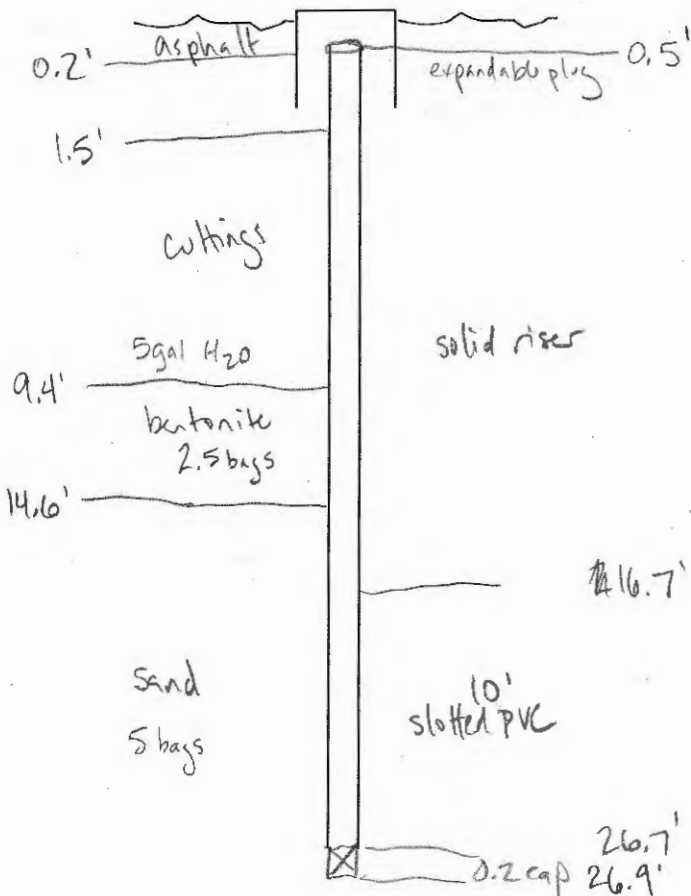
Flush Mount  Post   
 Monument height: \_\_\_\_\_ N/A   
 Monument Diameter: 6" N/A

**LOCK:**

Type: N/A  
 Combination: \_\_\_\_\_  
 Length cutoff last section: 3.3'

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Time between installation/development: \_\_\_\_\_  
 Engineer or Geologist: SKD





**MONITORING WELL CONSTRUCTION DETAILS**

Shannon & Wilson, Inc.

Job No: 101293 Project: WES 5021  
 Weather: hot sunny  
 Well No.: MW48  
 Date: 7/1/2020 Time Started: 1:25 Time Completed: 2:30

**WELL DATA:**

Pipe Type: schedule 40 PVC  
 Diameter: 2"  
 Total Depth (ft bgs): 26.5'  
 Well Screen Interval (feet): 16-26'  
 Top of Well Screen (ft bgs): 16.0  
 Slot size: 0.1"  
 Casing Connection: threaded  
 Depth below surface: 0.6' N/A   
 Casing stickup: \_\_\_\_\_ N/A

**PACKING MATERIAL:**

	Depth below ground surface:	
	From	To
Soil Cuttings:	<u>2.3</u>	<u>8.4</u>
Sand (20-40):	_____	_____
Bentonite chips:	<u>8.4</u>	<u>13.6</u>
Sand (20-40):	<u>13.6</u>	<u>26.5'</u>
	<u>10-20</u>	

**MONUMENT:**

Flush Mount  Post   
 Monument height: \_\_\_\_\_ N/A   
 Monument Diameter: 6" N/A

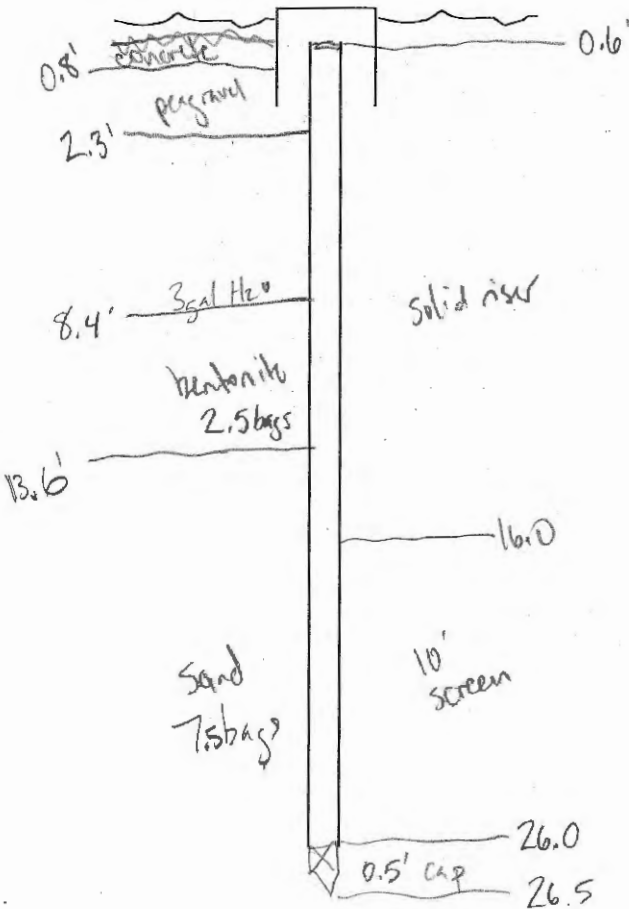
**LOCK:**

Type: N/A  
 Combination: \_\_\_\_\_  
 Length cutoff last section: \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Time between installation/development: \_\_\_\_\_

Engineer or Geologist: SKD





# MONITORING WELL CONSTRUCTION DETAILS

Shannon & Wilson, Inc.

Job No: 101293 Project: WES 5021  
 Weather: too hot  
 Well No.: MW 49  
 Date: 7/1/2020 Time Started: 4:25 Time Completed: 6:10

### WELL DATA:

Pipe Type: schedule 40 PVC  
 Diameter: 2"  
 Total Depth (ft bgs): 29.0  
 Well Screen Interval (feet): 28.5-18.5  
 Top of Well Screen (ft bgs): 18.5  
 Slot size: 0.1"  
 Casing Connection: threaded  
 Depth below surface: 0.3' N/A   
 Casing stickup: \_\_\_\_\_ N/A

### PACKING MATERIAL:

	Depth below ground surface:	
	From	To
Soil Cuttings:	<u>12.1</u>	<u>1.8</u>
Sand (20-40):	_____	_____
Bentonite chips:	<u>17.0</u>	<u>12.1</u>
Sand (20-40):	<u>29</u>	<u>17.0</u>
	<u>10-20</u>	_____

### MONUMENT:

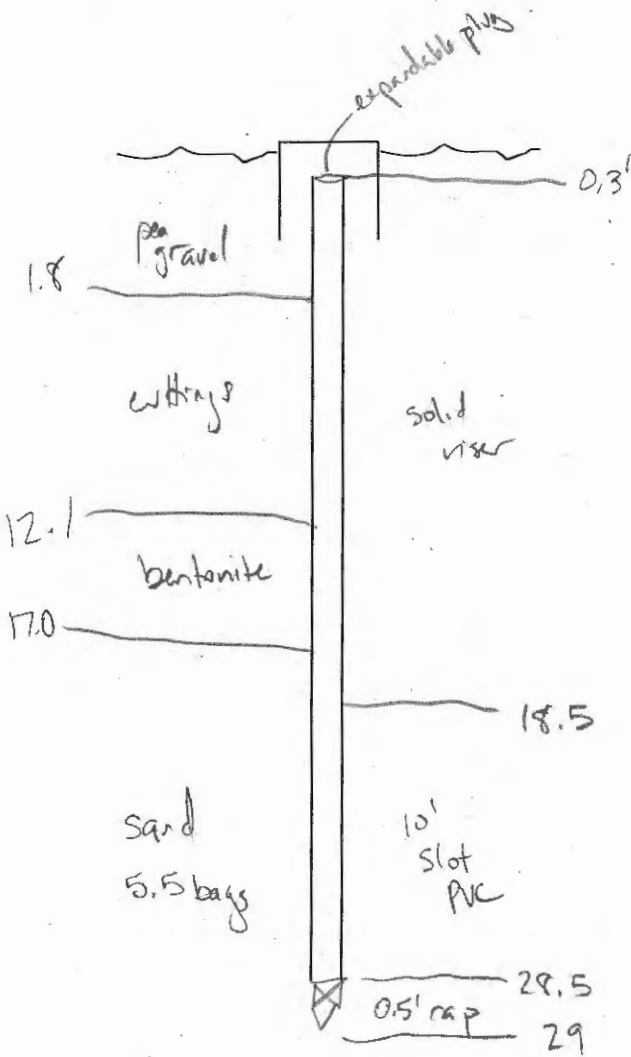
Flush Mount  Post   
 Monument height: \_\_\_\_\_ N/A   
 Monument Diameter: \_\_\_\_\_ N/A

### LOCK:

Type: N/A  
 Combination: \_\_\_\_\_  
 Length cutoff last section: \_\_\_\_\_

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Time between installation/development: \_\_\_\_\_  
 Engineer or Geologist: SKD



5:15 switch to pull MW 39  
 5:45 pulled all 30' 1 bag bentonite



# WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

Job No: 32-1-20040

Location: 6010 old Seward Hwy Weather: 60° Rain

Concern: \_\_\_\_\_

Well No.: MW-45

Develop Date: 7/17/20

Time Started: 0855

Time Completed: 1215

## PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_

Time of Depth Measurement: 0910

Diameter of Casing: 1"  2"

Total Depth of Well Below MP: 34.06

Depth-to-Water (DTW) Below MP: 26.81

Water Column in Well: 7.25 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.14

Gallons in Well: 1.16 (Water Column in Well x Gallons per foot)

Three Well Volumes: 3.48 (Gallons in Well x 3)

Gallons Purged: 5.30

## DEVELOPMENT DATA

Odor: None Color: Brown/ Grey - Silty

DTW	Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)	
30.09	0930	1.5	10.2	442	5.98	60	>1000	
32.45	0948	3.5	8.9	364	6.06	117	>1000	
33.56	1050	4.0	11.5	347	7.12	174	>1000	
		* Purged Dry → Await Recharge *						
33.47	1037	4.5	10.2	469	5.68	154	>1000 (purged Dry)	
33.41	1103	4.75	10.2	391	6.96	99	>1000 (purged Dry)	
33.32	1137	5.05	13.6	383	7.21	141	>1000 (purged Dry)	
1200		5.30	12.7	401	6.72	151	>1000 (purged Dry)	

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	0915 - 0920 (5)	1.5	0925 - 0930 (5)
2	0935 - 0940 (5)	2.0	0943 - 0948 (5)
3	0950 - 0955 (5)	0.5	0958 - 1000 (2)
4	1030 - 1035 (5)	0.5	1036 - 1037 (2)
5	1055 - 1100 (5)	0.25	1102 - 1103 (1)
6	1129 - 1134 (5)	0.30	1136 - 1137 (1)

Evacuation Method: Proactive Pump / Other: Mini. whale / Double Surge Block: 3'

Remarks: @ 32.40 - 1030 (DTW), DTW - 32.61 @ 1055, DTW - 32.51 @ 1123

DTW - 32.70 @ 1155

Sampling Personnel: ASR

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





Shannon & Wilson, Inc.

### WELL DEVELOPMENT LOG

Job No: 32-1-20040 Location: 6010 old seaward Hwy Weather: 63° cloudy  
 Concern: \_\_\_\_\_ Well No.: MW-46  
 Develop Date: 7/17/20 Time Started: 1218 Time Completed: 1530

#### PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Time of Depth Measurement: 1220  
 Diameter of Casing: 1"  2"   
 Total Depth of Well Below MP: 29.11  
 Depth-to-Water (DTW) Below MP: 25.52  
 Water Column in Well: 3.59 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 0.57 (Water Column in Well x Gallons per foot)  
 Three Well Volumes: 1.72 (Gallons in Well x 3)  
 Gallons Purged: 46

#### DEVELOPMENT DATA

Odor: POL odor Color: Grey - Silty

<u>DTW</u>	Time:	Gallons: (total)	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
<u>25.54</u>	<u>1239</u>	<u>3.0</u>	<u>10.6</u>	<u>924</u>	<u>6.71</u>	<u>-47</u>	<u>21000</u>
<u>25.59</u>	<u>1255</u>	<u>8.0</u>	<u>10.5</u>	<u>960</u>	<u>7.63</u>	<u>-109</u>	<u>724.7</u>
<u>25.56</u>	<u>1311</u>	<u>14.5</u>	<u>11.0</u>	<u>964</u>	<u>7.83</u>	<u>-96</u>	<u>360.8</u>
<u>25.54</u>	<u>1326</u>	<u>18.0</u>	<u>11.4</u>	<u>963</u>	<u>7.99</u>	<u>-72</u>	<u>682.3</u>
<u>25.54</u>	<u>1342</u>	<u>22.0</u>	<u>11.2</u>	<u>985</u>	<u>7.02</u>	<u>-87</u>	<u>542.5</u>
<u>25.54</u>	<u>1400</u>	<u>25.75</u>	<u>12.8</u>	<u>932</u>	<u>7.68</u>	<u>-90</u>	<u>830.9</u>
<u>25.54</u>	<u>1418</u>	<u>29.50</u>	<u>11.8</u>	<u>996</u>	<u>7.24</u>	<u>-82</u>	<u>670.8</u>
<u>25.55</u>	<u>1434</u>	<u>33.50</u>	<u>10.5</u>	<u>962</u>	<u>7.01</u>	<u>-61</u>	<u>597.6</u>

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	<u>1227 - 1232 (5)</u>	<u>3.0</u>	<u>1234 - 1239 (5)</u>
2	<u>1243 - 1248 (5)</u>	<u>5.0</u>	<u>1250 - 1255 (5)</u>
3	<u>1258 - 1303 (5)</u>	<u>6.5</u>	<u>1306 - 1311 (5)</u>
4	<u>1313 - 1318 (5)</u>	<u>3.5</u>	<u>1321 - 1326 (5)</u>
5	<u>1330 - 1335 (5)</u>	<u>4.0</u>	<u>1337 - 1342 (5)</u>
6	<u>1246 - 1251</u>	<u>3.75</u>	<u>1255 - 1400</u>

Evacuation Method: Proactive Pump / Other: Mini whirl Surge Block: 2'

Remarks: \_\_\_\_\_

Sampling Personnel: AJR

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









Shannon & Wilson, Inc.

### WELL DEVELOPMENT LOG

Job No: 32-1-20040 Location: 6010 Old Concord Hwy Weather: 64°, cloudy  
 Concern: \_\_\_\_\_ Well No.: uw-47  
 Develop Date: 7/20/20 Time Started: 1045 Time Completed: 1340

#### PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Time of Depth Measurement: 1050  
 Diameter of Casing: 1"  2"   
 Total Depth of Well Below MP: 26.56  
 Depth-to-Water (DTW) Below MP: 22.27  
 Water Column in Well: 4.29 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.14  
 Gallons in Well: 0.69 (Water Column in Well x Gallons per foot)  
 Three Well Volumes: 2.07 (Gallons in Well x 3)  
 Gallons Purged: 55.0

#### DEVELOPMENT DATA

Odor: None Color: gray/brown - silty

Time	Gallons	Temp (°C)	Sp. Cond. (mS/cm)	pH (S.U.)	ORP (mV)	Turb (ntu)
<u>22:51 1111</u>	<u>1.5</u>	<u>9.8</u>	<u>379</u>	<u>8.10</u>	<u>268</u>	<u>&gt;1000</u>
<u>22:39 1145</u>	<u>6.25</u>	<u>10.8</u>	<u>389</u>	<u>7.92</u>	<u>&gt;1000</u>	<u>&gt;1000</u>
<u>22:36 1200</u>	<u>12.25</u>	<u>10.7</u>	<u>397</u>	<u>8.14</u>	<u>857</u>	<u>736.0</u>
<u>22:29 1234</u>	<u>21.25</u>	<u>10.8</u>	<u>396</u>	<u>7.90</u>	<u>1000-776</u>	<u>461.5</u>
<u>22:31 1250</u>	<u>34.25</u>	<u>9.6</u>	<u>400</u>	<u>8.35</u>	<u>823</u>	<u>642.5</u>
<u>22:35 1312</u>	<u>45.25</u>	<u>12.8</u>	<u>410</u>	<u>6.84</u>	<u>806</u>	<u>425.9</u>
<u>1330</u>	<u>55.0</u>	<u>11.6</u>	<u>426</u>	<u>7.26</u>	<u>829</u>	<u>375.6</u>

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	1106 - 1109	1.5	1106 - 1111 (5)
2	1135 - 1140	4.75	1140 - 1145 (5)
3	1149 - 1154	6.0	1155 - 1200 (5)
4	<del>1223</del> 1223 - 1228	9.0	1229 - 1234 (5)
5	1236 - 1239	13.0	1241 - 1250 (9)
6	1258 - 1301	11.0	1302 - 1312 (10)

Evacuation Method: Proactive Pump Other: mini wheel Surge Block: 3' 1320 - 1330

Remarks: \_\_\_\_\_

Sampling Personnel: AJR

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



# WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

Job No: 32-1-20040

Location: 6200 old sewer Hwy. Weather: 55° rain

Concern: \_\_\_\_\_

Well No.: MW-48

Develop Date: 7/20/20

Time Started: 0920

Time Completed: 1221

## PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_

Time of Depth Measurement: 0925

Diameter of Casing: 1"  2"

Total Depth of Well Below MP: 26.0

Depth-to-Water (DTW) Below MP: 21.10

Water Column in Well: 4.90 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.14

Gallons in Well: 0.784 (Water Column in Well x Gallons per foot)

Three Well Volumes: 2.35 (Gallons in Well x 3)

Gallons Purged: 4.3

## DEVELOPMENT DATA

Odor: None Color: Dark Silty

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
<u>23.15</u>	<u>0.75</u>	<u>9.6</u>	<u>558</u>	<u>8.53</u>	<u>451</u>	<u>&gt;1000</u>
<u>25.50</u>	<u>1.5</u>	<u>9.7</u>	<u>417</u>	<u>8.74</u>	<u>434</u>	<u>&gt;1000</u>
<u>25.46</u>	<u>2.0</u>	<u>9.5</u>	<u>503</u>	<u>8.28</u>	<u>298</u>	<u>&gt;2000</u>
<u>25.21</u>	<u>3.1</u>	<u>11.2</u>	<u>501</u>	<u>7.94</u>	<u>206</u>	<u>&gt;1000</u>
<u>25.31</u>	<u>4.3</u>	<u>10.3</u>	<u>528</u>	<u>7.83</u>	<u>406</u>	<u>&gt;1000</u>

*purged Dry  
purged Dry  
purged Dry  
purged Dry*

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	<u>0930-0935 (5)</u>	<u>0.75</u>	<u>0938-0943 (5)</u>
2	<u>0947-0952 (5)</u>	<u>0.75</u>	<u>0953-0957 (4)</u>
3	<u>1028-1033 (5)</u>	<u>0.50</u>	<u>1033-1036 (3)</u>
4	<u>1121-1126 (5)</u>	<u>1.1</u>	<u>1127-1128 (5)</u>
5	<u>1209-1212 (3)</u>	<u>1.2</u>	<u>1213-1215</u>
6			

*purged Dry  
purged Dry  
purged Dry  
purged Dry*

Evacuation Method: Proactive Pump / Other: Mini-whale Surge Block: 2'

Remarks: DTW - 24.51 @ 1025. DTW - 21.10 @ 1120

Sampling Personnel: ASR

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



# WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

6010 Old Seward Hwy.

Job No: 32-1-20040

Location: MW-49

Weather: 65° Sunny

Concern: \_\_\_\_\_

Well No.: MW-49

Develop Date: 7/20/20

Time Started: 1355 1345

Time Completed: 1405 1605

## PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_

Time of Depth Measurement: 1356

Diameter of Casing: 1"  2"

Total Depth of Well Below MP: 27.22

Depth-to-Water (DTW) Below MP: 21.14

Water Column in Well: 6.08 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.97 ~~0.16~~

Gallons in Well: 0.97 (Water Column in Well x Gallons per foot)

Three Well Volumes: 2.91 (Gallons in Well x 3)

Gallons Purged: \_\_\_\_\_

## DEVELOPMENT DATA

Odor: None Color: gray / brown - silty

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
<u>1411</u>	<u>4.0</u>	<u>12.2</u>	<u>535</u>	<u>8.01</u>	<u>227</u>	<u>&gt;1000</u>
<u>1425</u>	<u>5.75</u>	<u>10.3</u>	<u>477</u>	<u>8.48</u>	<u>328</u>	<u>&gt;1000</u>
<u>1442</u>	<u>7.75</u>	<u>11.6</u>	<u>469</u>	<u>8.40</u>	<u>401</u>	<u>&gt;1000</u> *purged Dry x
<u>1500</u>	<u>10.0</u>	<u>8.9</u>	<u>456</u>	<u>8.31</u>	<u>299</u>	<u>&gt;1000</u> *purged Dry x
<u>1518</u>	<u>12.0</u>	<u>10.5</u>	<u>466</u>	<u>8.44</u>	<u>316</u>	<u>&gt;1000</u> purged Dry.
<u>1538</u>	<u>14.25</u>	<u>9.9</u>	<u>422</u>	<u>8.72</u>	<u>357</u>	<u>&gt;100</u> *purged Dry x
<u>1554</u>	<u>16.50</u>	<u>11.9</u>	<u>476</u>	<u>8.06</u>	<u>404</u>	*purged Dry x

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	1358 - 1401 (3)	4.0	1401 - 1411 (10)
2	1413 - 1416 (3)	<del>1.75</del> <sup>AKR</sup> 2.0 / 1.75	1420 - 1425 (5)
3	1427 - 1430 (3)	2.0	1432 - <del>1433</del> <sup>AKR</sup> 1442 (10)
4	1452 - 1455 (3)	2.25	1456 - 1500 (4)
5	1509 - 1512 (3)	2.0	1513 - 1518 (5)
6	1529 - 1532 (3)	2.25	1533 - 1538 (5)

Evacuation Method: Proactive Pump / Other: Mini whale Surge Block: 3 1550 - 1554 (5) 4

Remarks: DTW - 23.45 @ 1450; DTW 24.22 @ 1508; DTW 24.10 @ 1528;

DTW @ - 24.00 @ 1545

Sampling Personnel: AKR

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



### LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 0010 old Seward Hwy Weather: 68° Sunny  
 Well No.: B5W  
 Date: 7/20/20 Time Started: 1600 Time Completed: 1605  
 Develop Date: — Develop End Time: — (24 hour break)

### INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1600 Date of Depth Measurement: 7/20/20  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: —  
 Diameter of Casing: 2" Well Screen Interval: —  
 Total Depth of Well Below MP: 31.99 Product Thickness, if noted: — None  
 Depth-to-Water (DTW) Below MP: 24.68  
 Water Column in Well: 7.31 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 1.17 (Water Column in Well x Gallons per foot)

### PURGING DATA

Date Purged: — Time Started: — Time Completed: —  
 Three Well Volumes: — (Gallons in Well x 3)  
 Gallons Purged: — Depth of Pump (generally 2 ft from bottom): —  
 Max. Drawdown (generally 0.3 ft): — Pump Rate: —  
 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)

### SAMPLING DATA

Odor: — Color: —  
 Sample Designation: — Time / Date: —  
 QC Sample Designation: — Time / Date: —  
 QA Sample Designation: — Time / Date: —  
 Evacuation Method: Submersible Pump / Other: —  
 Sampling Method: Submersible Pump / Other: —  
 Water Quality Instruments Used/Manufacturer/Model Number —  
 Calibration Info (Time, Ranges, etc) —  
 Remarks: —

Sampling Personnel: —  
 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



# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6610 old Seward Hwy Weather: 66° Sunny  
 Well No.: MW-42  
 Date: 7/28/20 Time Started: 1325 Time Completed: 1515  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1330 Date of Depth Measurement: 7/28/20  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 34.92 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 26.97  
 Water Column in Well: 7.95 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.10  
 Gallons in Well: 1.27 (Water Column in Well x Gallons per foot)

## PURGING DATA

Date Purged: 7/28/20 Time Started: 1337 Time Completed: 1455  
 Three Well Volumes: 3.81 (Gallons in Well x 3)  
 Gallons Purged: 6.0 Depth of Pump (generally 2 ft from bottom): ~28  
 Max. Drawdown (generally 0.3 ft): 0.78 Pump Rate: 0.4 - 0.5  
 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)
1342	0.7	0.5	27.75	0.78	10.46	438	1.42	5.07	243.3	37.28
1347	1.2	0.4	27.71	0.74	10.87	443	0.96	4.99	234.4	49.97
1352	1.6	0.4	27.77	0.74	11.04	482	1.01	5.00	212.3	24.76
1357	2.0	0.4	27.70	0.73	11.05	562	0.78	5.05	273.2	20.46
1402	2.4	0.4	27.70	0.73	10.96	712	0.60	5.15	126.8	14.22
1407	2.8	0.4	27.70	0.73	10.89	751	0.53	5.26	114.3	13.74

## SAMPLING DATA

Odor: None PAH odor Color: clear  
 Sample Designation: 101293-MW42 Time / Date: 1450 7/28/20  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 Evacuation Method: Submersible Pump / Other: mini volde  
 Sampling Method: Submersible Pump / Other: mini volde  
 Water Quality Instruments Used/Manufacturer/Model Number YSI + MCLW TPW  
 Calibration Info (Time, Ranges, etc) 0 0030 on 7/28/20  
 Remarks: \_\_\_\_\_  
 Sampling Personnel: ASR

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



Shannon & Wilson, Inc.

### LOW-FLOW WATER SAMPLING LOG

Continued from previous page

Job No: 101293  
Well No.: MW-42  
Date: 7/23/20

Location: 6010 Old Seward Hwy Site: 6010 Old Seward Hwy

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)
1412	3.2	0.4	27.50	0.53	11.20	762	0.44	5.30	109.5	13.27
1417	3.6	0.4	27.50	0.53	13.20	778	0.42	5.51	94.2	8.49
1422	3.4	0.4	27.41	0.44	14.38	784	0.38	6.02	60.1	10.26
1425	4.4	0.4	27.50	0.53	12.30	838	0.33	6.33	49.0	8.74
1427	4.8	0.4	27.50	0.53	11.98	843	1.34	6.11	52.9	8.02
1432	4.8	0.4	27.50	0.53	11.69	831	0.63	6.17	59.0	7.69
1437	5.2	0.4	27.50	0.53	11.76	822	0.43	6.06	62.0	7.94
1442	5.6	0.4	27.50	0.53	11.74	817	0.38	6.04	61.9	7.98
1445	5.8	0.4	27.50	0.53	11.76	816	0.32	6.04	64.8	7.74
1448	6.0	0.4	27.50	0.53						

Interval (minutes)	Pump Rate (mL/min):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
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ADEC (May 2010)	3 to 5	100 to 150	<0.0328	±3% or ±0.2	±3%	±10%	±0.1	±10	±10%
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EPA (Jan. 2010)	5	50	<0.3	±3%	±3%	±10%	±0.1	±10	±10% or <5 NTU
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EPA guidance requires all parameters to stabilize for 3 consecutive readings before sampling. If not stable within 2 hours, collect sample.

ADEC guidance requires 3 parameters (4 if using temperature) to stabilize for 3 consecutive readings before sampling.



# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 Old Seward Hwy Weather: 62° Sunny  
 Well No.: MW 45  
 Date: 7/28/2020 Time Started: 11:50 Time Completed: 1230  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 11:50 Date of Depth Measurement: 7/28  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 34.20 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 26.81  
 Water Column in Well: 7.39 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 1.18 (Water Column in Well x Gallons per foot)  
**BM = 26.81**

## PURGING DATA

Date Purged: 7/28 Time Started: 12:00 Time Completed: \_\_\_\_\_  
 Three Well Volumes: 3.54 (Gallons in Well x 3)  
 Gallons Purged: \_\_\_\_\_ Depth of Pump (generally 2 ft from bottom): 29.0 ft  
 Max. Drawdown (generally 0.3 ft): \_\_\_\_\_ Pump Rate: \_\_\_\_\_  
 Well Purged Dry: Yes  No  (If yes, use Well Purged Dry Log) 12:25

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>12:03</u>	<u>0.1</u>	<u>0.1</u>	<u>27.74</u>	<u>0.93</u>	<u>15.70</u>	<u>334</u>	<u>8.39</u>	<u>6.71</u>	<u>57</u>	<u>95.98</u>
<u>12:06</u>	<u>0.2</u>	<u>0.1</u>	<u>27.86</u>	<u>1.05</u>	<u>15.77</u>	<u>305</u>	<u>8.03</u>	<u>6.77</u>	<u>65</u>	<u>93.42</u>
<u>12:09</u>	<u>0.3</u>	<u>0.1</u>	<u>27.91</u>	<u>1.10</u>	<u>16.27</u>	<u>297</u>	<u>7.56</u>	<u>6.85</u>	<u>79</u>	<u>100.9</u>
<u>12:12</u>	<u>0.4</u>	<u>0.1</u>	<u>28.12</u>	<u>1.31</u>	<u>16.61</u>	<u>293</u>	<u>7.93</u>	<u>6.84</u>	<u>90</u>	<u>209.0</u>
<u>12:15</u>	<u>0.5</u>	<u>0.1</u>	<u>28.37</u>	<u>1.56</u>	<u>16.24</u>	<u>277</u>	<u>8.46</u>	<u>6.96</u>	<u>98</u>	<u>214.0</u>
<u>12:20</u>	<u>0.6</u>	<u>0.1</u>	<u>31.50</u>	<u>4.69</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

## SAMPLING DATA

Odor: None Color: Clear  
 Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 Evacuation Method: Submersible Pump / Other: Single Whale  
 Sampling Method: Submersible Pump / Other: Single Whale  
 Water Quality Instruments Used/Manufacturer/Model Number Horiuba + Turbidimeter  
 Calibration Info (Time, Ranges, etc) 9:30 7/28  
 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







# WELL PURGED DRY LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 Old Seward Hwy Weather: 68° Sunny  
 Concern: \_\_\_\_\_ Well No.: MW-45  
 Date: 7/28/20 Time Started: 1530 Time Completed: 1550

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1150 Date of Depth Measurement: 7/28/20  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 34.20 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 26.81  
 Water Column in Well: 7.39 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 1.18 (Water Column in Well x Gallons per foot)

## PURGING DATA

Date Purged: 7/28/20 Time Started: 1534 Time Completed: 1550  
 80% Recovery Water Column: 5.91 (Water Column in Well x 0.8)  
 80% Recovery DTW: 28.29 (Initial DTW + (Water Col. - 80% Recovery Water Col.)

Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate
<u>1225</u>	<u>1530</u>	<u>27.56</u>	<u>0.4</u>

## FIELD PARAMETERS AT TIME OF SAMPLING

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft BMP):	Temp: (°C)	Sp. Cond.: (uS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>1539</u>	<u>0.25</u>	<u>0.2</u>	<u>28.11</u>	<u>-1.3</u>	<u>17.59</u>	<u>248</u>	<u>6.75</u>	<u>6</u>	<u>330.6</u>

## SAMPLING DATA

Odor: None Color: gray - silty  
 Sample Designation: 101293-MW-45 MW45 Time / Date: 1540 7/28/20  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_

Evacuation Method: Whale Pump / Bladder Pump / Other: mini whale  
 Sampling Method: Whale Pump / Bladder Pump / Other: mini whale

Remarks: \_\_\_\_\_

Sampling Personnel: APR / ZAT

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



# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 old Seward Hwy Weather: 60° mostly sunny  
 Well No.: MW46  
 Date: 7/28/2020 Time Started: 10:40 Time Completed: 11:37  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 10:40 Date of Depth Measurement: 7/28  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 28.96 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW), Below MP: 25.53  
 Water Column in Well: 3.43 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 0.55 (Water Column in Well x Gallons per foot)

## PURGING DATA

Date Purged: 7/28/2020 Time Started: 10:43 Time Completed: 11:27  
 Three Well Volumes: 1.65 (Gallons in Well x 3)  
 Gallons Purged: 2.5 Depth of Pump (generally 2 ft from bottom): 27.50 ft  
 Max. Drawdown (generally 0.3 ft): 0.01 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)
10:50	0.4	0.2	25.54	0.01	11.77	823	7.71	6.55	-52	77.01
10:53	0.5	0.2	25.54	0.01	11.81	820	7.46	6.55	-53	86.47
10:56	0.75	0.2	25.54	0.01	11.62	823	6.50	6.58	-64	63.55
10:59	1.0	0.2	25.54	0.01	11.53	826	<del>6.48</del>	6.58	-65	57.13
11:02	1.25	0.2	25.54	0.01	11.45	825	6.25	6.59	-66	53.59
11:05	1.50	0.2	25.54	0.01	11.28	828	5.98	6.60	-70	46.40

## SAMPLING DATA

Odor: Sulfurous smell Color: clear  
 Sample Designation: 101293-MW46 Time / Date: 11:20 7/28  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 Evacuation Method: Submersible Pump / Other: Single Whale  
 Sampling Method: Submersible Pump / Other: Single Whale  
 Water Quality Instruments Used/Manufacturer/Model Number Horiba + Turbidimeter  
 Calibration Info (Time, Ranges, etc) 9:30 7/28  
 Remarks: \_\_\_\_\_

Sampling Personnel: 25T

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





# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 old seaward Hwy Weather: 57 partly cloudy  
 Well No.: MW47  
 Date: 7/28/2020 Time Started: 9:30 Time Completed: 10:25  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 9:32 Date of Depth Measurement: 7/28  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 26.65 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 22.39  
 Water Column in Well: 4.26 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 0.68 (Water Column in Well x Gallons per foot)

BM: 22.34

## PURGING DATA

Date Purged: 7/28 Time Started: 9:41 Time Completed: 10:15  
 Three Well Volumes: 2.04 (Gallons in Well x 3)  
 Gallons Purged: 2.2 Depth of Pump (generally 2 ft from bottom): 24.40 ft  
 Max. Drawdown (generally 0.3 ft): 6.01 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>9:44</u>	<u>0.25</u>	<u>0.2</u>	<u>22.40</u>	<u>0.01</u>	<u>13.22</u>	<u>461</u>	<u>7.61</u>	<u>5.56</u>	<u>230</u>	<u>288.1</u>
<u>9:47</u>	<u>0.50</u>	<u>0.2</u>	<u>22.40</u>	<u>0.01</u>	<u>12.40</u>	<u>463</u>	<u>7.65</u>	<u>5.63</u>	<u>228</u>	<u>269.3</u>
<u>9:50</u>	<u>0.75</u>	<u>0.2</u>	<u>22.40</u>	<u>0.01</u>	<u>11.37</u>	<u>457</u>	<u>7.85</u>	<u>5.75</u>	<u>225</u>	<u>233.3</u>
<u>9:53</u>	<u>1.00</u>	<u>0.2</u>	<u>22.40</u>	<u>0.01</u>	<u>11.29</u>	<u>456</u>	<u>7.37</u>	<u>5.83</u>	<u>223</u>	<u>154.3</u>
<u>9:56</u>	<u>1.20</u>	<u>0.2</u>	<u>22.40</u>	<u>0.01</u>	<u>11.19</u>	<u>457</u>	<u>7.13</u>	<u>5.89</u>	<u>221</u>	<u>119.6</u>
<u>9:59</u>	<u>1.50</u>	<u>0.2</u>	<u>22.40</u>	<u>0.01</u>	<u>11.34</u>	<u>452</u>	<u>6.22</u>	<u>6.01</u>	<u>216</u>	<u>78.52</u>

## SAMPLING DATA

Odor: None Color: Light tan-gray  
 Sample Designation: 101293-MW47 Time / Date: 10:15 7/28  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_

Evacuation Method: Submersible Pump / Other: Single Whale  
 Sampling Method: Submersible Pump / Other: Single whale  
 Water Quality Instruments Used/Manufacturer/Model Number Horiba / Turbidimeter  
 Calibration Info (Time, Ranges, etc) 9:30 7/28

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





# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 Old Seward Hwy Weather: 87° cloudy  
 Well No.: MW-48  
 Date: 7/28/20 Time Started: 0840 Time Completed: 1020  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 0845 Date of Depth Measurement: 7/28/20  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 25.90 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 21.12  
 Water Column in Well: 4.78 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 0.76 (Water Column in Well x Gallons per foot)

## PURGING DATA

Date Purged: 7/28/20 Time Started: 0858 Time Completed: 1010  
 Three Well Volumes: 2.28 (Gallons in Well x 3)  
 Gallons Purged: 2.5 Depth of Pump (generally 2 ft from bottom): ~23  
 Max. Drawdown (generally 0.3 ft): 0.10 Pump Rate: 0.1 - 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>0908</u>	<u>0.6</u>	<u>0.2</u>	<u>21.20</u>	<u>0.08</u>	<u>8.36</u>	<u>666</u>	<u>2.77</u>	<u>4.89</u>	<u>167.3</u>	<u>513.8</u>
<u>0913</u>	<u>0.75</u>	<u>0.1</u>	<u>21.22</u>	<u>0.10</u>	<u>8.32</u>	<u>624</u>	<u>0.72</u>	<u>4.95</u>	<u>193.9</u>	<u>339.3</u>
<u>0918</u>	<u>0.90</u>	<u>0.1</u>	<u>21.22</u>	<u>0.10</u>	<u>8.36</u>	<u>622</u>	<u>0.60</u>	<u>4.14</u>	<u>255.7</u>	<u>323.2</u>
<u>0923</u>	<u>1.1</u>	<u>0.1</u>	<u>21.22</u>	<u>0.10</u>	<u>8.44</u>	<u>615</u>	<u>0.55</u>	<u>3.57</u>	<u>263.6</u>	<u>205.1</u>
<u>0928</u>	<u>1.3</u>	<u>0.1</u>	<u>21.20</u>	<u>0.08</u>	<u>8.39</u>	<u>613</u>	<u>0.61</u>	<u>3.61</u>	<u>240.4</u>	<u>137.8</u>
<u>0933</u>	<u>1.5</u>	<u>0.1</u>	<u>21.20</u>	<u>0.08</u>	<u>8.31</u>	<u>612</u>	<u>0.53</u>	<u>3.70</u>	<u>219.0</u>	<u>103.0</u>

## SAMPLING DATA

Odor: None Color: Clear  
 Sample Designation: 101293 - MW48 Time / Date: 1005 7/28/20  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_

Evacuation Method: Submersible Pump / Other: Mini Whale

Sampling Method: Submersible Pump / Other: Mini whale

Water Quality Instruments Used/Manufacturer/Model Number YSI 556 + MILVO TPW

Calibration Info (Time, Ranges, etc) @ 830 on 7/28/20

Remarks: \_\_\_\_\_

Sampling Personnel: AJR

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



Shannon & Wilson, Inc.

**LOW-FLOW WATER SAMPLING LOG**

Continued from previous page

Job No: 17293  
 Well No.: MW-48  
 Date: 7/28/20

Location: 6010 Old Seward Hwy Site: 6010 Old Seward Hwy

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)
0938	1.70	0.1	21.20	0.08	8.22	612	0.53	3.74	208.2	72.64
0943	1.90	0.1	21.20	0.08	8.27	610	0.54	3.83	190.2	56.81
0946	2.0	0.1	21.20	0.08	8.23	610	0.60	3.88	179.9	40.99
0949	2.1	0.1	21.20	0.08	8.19	609	0.60	3.94	168.8	31.50
0952	2.2	0.1	21.20	0.08	8.22	608	0.62	3.98	160.1	30.85
0955	2.3	0.1	21.20	0.08	8.20	608	0.56	4.04	148.4	19.88
0958	2.4	0.1	21.20	0.08	8.18	608	0.51	4.10	146.4	18.70
1003	2.5	0.1	21.20	0.08	8.15	608	0.46	4.11	141.6	16.41

	Interval (minutes)	Pump Rate (mL/min):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
ADEC (May 2010)	3 to 5	100 to 150	<0.0328	±3% or ±0.2	±3%	±10%	±0.1	±10	±10%
EPA (Jan. 2010)	5	50	<0.3	±3%	±3%	±10%	±0.1	±10	±10% or <5 NTU

EPA guidance requires all parameters to stabilize for 3 consecutive readings before sampling. If not stable within 2 hours, collect sample.  
 ADEC guidance requires 3 parameters (4 if using temperature) to stabilize for 3 consecutive readings before sampling.



# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 oldeward Hwy Weather: 63° partly cloudy  
 Well No.: mw-49  
 Date: 7/28/20 Time Started: 1025 Time Completed: 1145  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1027 Date of Depth Measurement: 7/28/20  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 28.04 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 21.85  
 Water Column in Well: 6.19 (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: 7/28/20 Time Started: 1030 Time Completed: 1129  
 Three Well Volumes: 2.97 (Gallons in Well x 3)  
 Gallons Purged: 3.1 Depth of Pump (generally 2 ft from bottom): ~23.0  
 Max. Drawdown (generally 0.3 ft): 0.56 Pump Rate: 0.2 - 0.5  
 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)
1035	0.70	0.5	22.41	0.56	7.39	507	1.01	7.50	132.3	290.4
1040	1.00	0.2	22.32	0.47	9.13	522	0.73	6.17	100.3	296.6
1045	1.25	0.2	22.28	0.43	9.95	502	0.58	6.30	162.1	197.1
1050	1.50	0.2	22.25	0.40	10.27	504	0.49	6.61	141.7	110.1
1055	1.70	0.2	22.31	0.46	10.01	504	0.45	6.83	131.0	81.48
1100	2.0	0.2	22.35	0.50	9.09	505	0.45	6.77	135.0	46.44

## SAMPLING DATA

Odor: None Color: clear  
 Sample Designation: 101293-mw49 Time / Date: 1123 7/28/20  
 QC Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_

Evacuation Method: Submersible Pump / Other: mini whale  
 Sampling Method: Submersible Pump / Other: mini whale  
 Water Quality Instruments Used/Manufacturer/Model Number YSI + MINO TPOW  
 Calibration Info (Time, Ranges, etc) @ 830 on 7/28/20

Remarks: Exceeded drawdown after first 5 mins of purging

Sampling Personnel: ADR

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







# LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 101293 Location: 6010 Old Semard Hwy Weather: 62° sunny  
 Well No.: MW1R  
 Date: 7/28/2020 Time Started: 13:30 Time Completed: 14:40  
 Develop Date: \_\_\_\_\_ Develop End Time: \_\_\_\_\_ (24 hour break)

## INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 13:30 Date of Depth Measurement: 7/28  
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: \_\_\_\_\_  
 Diameter of Casing: 2" Well Screen Interval: \_\_\_\_\_  
 Total Depth of Well Below MP: 32.33 Product Thickness, if noted: \_\_\_\_\_  
 Depth-to-Water (DTW) Below MP: 22.82  
 Water Column in Well: 9.51 (Total Depth of Well Below MP - DTW Below MP)  
 Gallons per foot: 0.16  
 Gallons in Well: 1.52 (Water Column in Well x Gallons per foot)

BM: 22.82

## PURGING DATA

Date Purged: 7/28 Time Started: 13:40 Time Completed: 14:30  
 Three Well Volumes: 4.56 (Gallons in Well x 3)  
 Gallons Purged: 1.55 Depth of Pump (generally 2 ft from bottom): 25"  
 Max. Drawdown (generally 0.3 ft): 0.17 Pump Rate: \_\_\_\_\_  
 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>13:43</u>	<u>0.25</u>	<u>0.2</u>	<u>22.98</u>	<u>0.16</u>	<u>14.88</u>	<u>1,380</u>	<u>2.42</u>	<u>6.55</u>	<u>95</u>	<u>634.2</u>
<u>13:46</u>	<u>0.50</u>	<u>0.2</u>	<u>22.98</u>	<u>0.16</u>	<u>15.21</u>	<u>1,360</u>	<u>1.83</u>	<u>6.58</u>	<u>27</u>	<u>167.0</u>
<u>13:49</u>	<u>0.65</u>	<u>0.2</u>	<u>22.99</u>	<u>0.17</u>	<u>14.85</u>	<u>1,380</u>	<u>1.48</u>	<u>6.59</u>	<u>20</u>	<u>59.21</u>
<u>13:52</u>	<u>0.70</u>	<u>0.2</u>	<u>22.98</u>	<u>0.16</u>	<u>15.25</u>	<u>1,380</u>	<u>1.27</u>	<u>6.59</u>	<u>17</u>	<u>35.37</u>
<u>13:55</u>	<u>0.80</u>	<u>0.2</u>	<u>22.99</u>	<u>0.17</u>	<u>14.65</u>	<u>1,400</u>	<u>1.18</u>	<u>6.60</u>	<u>14</u>	<u>23.64</u>
<u>13:58</u>	<u>0.95</u>	<u>0.2</u>	<u>22.99</u>	<u>0.17</u>	<u>14.64</u>	<u>1,420</u>	<u>1.04</u>	<u>6.61</u>	<u>11</u>	<u>19.64</u>

## SAMPLING DATA

Odor: Gas smell Color: Tan - Brown  
 Sample Designation: 101293-MW1R Time / Date: 14:15 7/28  
 QC Sample Designation: 101293-MW1OR Time / Date: 14:15 7/28  
 QA Sample Designation: \_\_\_\_\_ Time / Date: \_\_\_\_\_  
 Evacuation Method: Submersible Pump / Other: Single Whake  
 Sampling Method: Submersible Pump / Other: Single Whake  
 Water Quality Instruments Used/Manufacturer/Model Number Horiba + Turbidimeter  
 Calibration Info (Time, Ranges, etc) 9:30 7/28  
 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



**APPENDIX D**  
**DISPOSAL RECEIPTS**

# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. VSQG		Manifest Document No. 153187A		2. Page 1 of 1	
3. Generator's Name and Mailing Address FORMER WILLIAMS EXPRESS STORE #5021 6010 OLD SEWARD HWY ANCHORAGE, AK 99518				FORMER WILLIAMS EXPRESS STORE #502 6010 OLD SEWARD HWY ANCHORAGE, AK 99518			
4. Generator's Phone ( )				86			
5. Transporter 1 Company Name NRC ALASKA LLC		6. US EPA ID Number AKR000004184		A. State Transporter's ID		B. Transporter 1 Phone 907-258-1558	
7. Transporter 2 Company Name		8. US EPA ID Number		C. State Transporter's ID		D. Transporter 2 Phone	
9. Designated Facility Name and Site Address NRC ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501		10. US EPA ID Number AKR000004184		E. State Facility's ID		F. Facility's Phone 907-258-1558	
11. WASTE DESCRIPTION				Containers		13. Total Quantity	14. Unit Wt./Vol.
a. HM MATERIAL NOT REGULATED BY D.O.T.				4	DM	2800	P
b. <del>MATERIAL NOT REGULATED BY D.O.T.</del>					DM		P
c.							
d.							
G. Additional Descriptions for Materials Listed Above				H. Handling Codes for Wastes Listed Above			
1) EA0708 ADEC REPORTABLE CONTAMINATED SOIL				D30727			
2) EA8302 IDW DECON WATER / GROUNDWATER							
15. Special Handling Instructions and Additional Information  Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation							
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name Stephanie Dow				Signature <i>[Signature]</i>		Date 6/30/2020	
17. Transporter 1 Acknowledgement of Receipt of Materials				Printed/Typed Name Roy C. Trusciale JR		Signature <i>[Signature]</i>	
				Date 6/30/2020			
18. Transporter 2 Acknowledgement of Receipt of Materials				Printed/Typed Name		Signature	
				Date			
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.							
Printed/Typed Name Fatimicool Beasley				Signature <i>[Signature]</i>		Date 07/20/20	

NON-HAZARDOUS WASTE

TRANSPORTER

FACILITY



# CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: FORMER WILLIAMS EXPRESS STORE #5021  
6010 OLD SEWARD HWY  
ANCHORAGE, AK 99518

DISPOSAL FACILITY: NRC ALASKA LLC  
2020 VIKING DRIVE  
ANCHORAGE, AK 99501

EPA ID NUMBER: VSQG  
MANIFEST/DOCUMENT #: 153187A  
DATE OF DISPOSAL/RECYCLE: JUL-02-2020

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	ADEC REPORTABLE CONTAMINATED SOIL	4	DM	2800	P
2	IDW DECON WATER / GROUNDWATER	0	DM	0	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: <sup>PLD</sup> \_\_\_\_\_

SIGNATURE: Patricia S. Beasley

JUL 02 2020

DATE: \_\_\_\_\_



**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites and Prevention Preparedness and Response Programs**

**Contaminated Media Transport and Treatment or Disposal Approval Form**

<b>DEC HAZARD/SPILL ID #</b>	<b>NAME OF CONTAMINATED SITE OR SPILL</b>		
24042	Former Williams Express Store #5021		
<b>CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION</b>			
6010 Old Seward Highway			
<b>CURRENT PHYSICAL LOCATION OF MEDIA</b>		<b>SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)</b>	
in-situ		USTs	
<b>CONTAMINANTS OF CONCERN</b>	<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>	
GRO/DRO/VOCs/PAHs	Six 55-gallon drums	June 30 and July 1, 2020	
<b>POST TREATMENT ANALYSIS REQUIRED</b> (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)			
<b>COMMENTS OR OTHER IMPORTANT INFORMATION</b>			
Contaminated soil will be consolidated at NRC Alaska Anchorage facility, then manifested to Grandview Idaho, an EPA approved Subtitle C landfill for final disposal.			

<b>TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK
<b>RESPONSIBLE PARTY</b>	<b>ADDRESS/PHONE NUMBER</b>
Williams	One Williams CTR, Tulsa, OK 74172
<b>WASTE MANAGEMENT CO. / ORGANIZER</b>	<b>ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK

\*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

**Dan P. McMahon**  
 Name of the Person Requesting Approval (printed)  
 Dan P. McMahon  
 Digitally signed by Dan P. McMahon  
 DN: cn=Dan P. McMahon, o=Shannon & Wilson,  
 ou, email=dxm@shannwil.com, c=US  
 Date: 2020.06.17 16:07:28 -08'00'  
 Signature

**Senior Associate**  
 Title/Association  
 6/17/2020  
 Date  
 907-433-3223  
 Phone Number

-----DEC USE ONLY-----  
 Based on the information provided, ADEC approves transport of the above mentioned material. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

**Grant Lidren**  
 DEC Project Manager Name (printed)  
 Signature

**EPS IV**  
 Project Manager Title  
 6/18/2020  
 Date  
 229-4969  
 Phone Number



# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>VSQG</b>		Manifest Document No. <b>153187B</b>	2. Page 1 of <b>1</b>
3. Generator's Name and Mailing Address <b>FORMER WILLIAMS EXPRESS STORE #5021 6010 OLD SEWARD HWY ANCHORAGE, AK 99518</b>		FORMER WILLIAMS EXPRESS STORE #502' 6010 OLD SEWARD HWY ANCHORAGE, AK 99518		<b>86</b>	
4. Generator's Phone ( )					
5. Transporter 1 Company Name <b>NRC ALASKA LLC</b>		6. US EPA ID Number <b>AKR000004184</b>		A. State Transporter's ID <b>907-258-1558</b>	
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone	
9. Designated Facility Name and Site Address <b>NRC ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501</b>		10. US EPA ID Number <b>AKR000004184</b>		C. State Transporter's ID	
				D. Transporter 2 Phone	
				E. State Facility's ID	
				F. Facility's Phone <b>907-258-1558</b>	
11. WASTE DESCRIPTION			Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
a. <b>MATERIAL NOT REGULATED BY D.O.T.</b>			<b>6</b>	<b>DM</b>	<b>4,000</b>
b. <b>MATERIAL NOT REGULATED BY D.O.T.</b>				<b>DM</b>	<b>P</b>
c.					
d.					
G. Additional Descriptions for Materials Listed Above			H. Handling Codes for Wastes Listed Above		
1) EA0708 ADEC REPORTABLE CONTAMINATED SOIL			<b>D30728</b>		
2) EA0302 IDW DECON WATER / GROUNDWATER					
15. Special Handling Instructions and Additional Information					
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation					
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name <b>X Stephanie Dow</b>				Signature <i>[Signature]</i>	
				Date <b>7   1   2020</b>	
17. Transporter 1 Acknowledgement of Receipt of Materials					
Printed/Typed Name <i>[Signature]</i>				Signature <i>[Signature]</i>	
				Date <b>7   1   2020</b>	
18. Transporter 2 Acknowledgement of Receipt of Materials					
Printed/Typed Name				Signature	
				Date	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.					
Printed/Typed Name <b>Patricia L. Beasley</b>				Signature <i>[Signature]</i>	
				Date <b>07   02   20</b>	

NON-HAZARDOUS WASTE GENERATOR





# CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: FORMER WILLIAMS EXPRESS STORE #5021  
6010 OLD SEWARD HWY  
ANCHORAGE, AK 99518

DISPOSAL FACILITY: NRC ALASKA LLC  
2020 VIKING DRIVE  
ANCHORAGE, AK 99501

EPA ID NUMBER: VSQG  
MANIFEST/DOCUMENT #: 153187B  
DATE OF DISPOSAL/RECYCLE: JUL-02-2020

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	ADEC REPORTABLE CONTAMINATED SOIL	6	DM	4000	P
2	IDW DECON WATER / GROUNDWATER	0	DM	0	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: <sup>PLB</sup> \_\_\_\_\_

SIGNATURE: Patrick J. Beasley DATE: JUL 02 2020



**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites and Prevention Preparedness and Response Programs**

**Contaminated Media Transport and Treatment or Disposal Approval Form**

<b>DEC HAZARD/SPILL ID #</b>	<b>NAME OF CONTAMINATED SITE OR SPILL</b>		
24042	Former Williams Express Store #5021		
<b>CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION</b>			
6010 Old Seward Highway			
<b>CURRENT PHYSICAL LOCATION OF MEDIA</b>		<b>SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)</b>	
in-situ		USTs	
<b>CONTAMINANTS OF CONCERN</b>	<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>	
GRO/DRO/VOCs/PAHs	Six 55-gallon drums	June 30 and July 1, 2020	
<b>POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)</b>			
<b>COMMENTS OR OTHER IMPORTANT INFORMATION</b>			
Contaminated soil will be consolidated at NRC Alaska Anchorage facility, then manifested to Grandview Idaho, an EPA approved Subtitle C landfill for final disposal.			

<b>TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK
<b>RESPONSIBLE PARTY</b>	<b>ADDRESS/PHONE NUMBER</b>
Williams	One Williams CTR, Tulsa, OK 74172
<b>WASTE MANAGEMENT CO. / ORGANIZER</b>	<b>ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK

\*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

**Dan P. McMahon**

**Senior Associate**

Name of the Person Requesting Approval (printed)

Title/Association

**Dan P. McMahon**

Digitally signed by Dan P. McMahon  
DN: cn=Dan P. McMahon, o=Shannon & Wilson,  
ou, email=dxm@shanwil.com, c=US  
Date: 2020.06.17 16:07:28 -08'00'

**6/17/2020**

**907-433-3223**

Signature

Date

Phone Number

**-----DEC USE ONLY-----**

Based on the information provided, ADEC approves transport of the above mentioned material. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

**Grant Lidren**

**EPS IV**

DEC Project Manager Name (printed)

Project Manager Title

*Grant Lidren*

**6/18/2020**

**229-4969**

Signature

Date

Phone Number





# CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: FORMER WILLIAMS EXPRESS STORE #5021  
6010 OLD SEWARD HWY  
ANCHORAGE, AK 99518

DISPOSAL FACILITY: NRC ALASKA LLC  
2020 VIKING DRIVE  
ANCHORAGE, AK 99501

EPA ID NUMBER: VSQG  
MANIFEST/DOCUMENT #: 153187C  
DATE OF DISPOSAL/RECYCLE: JUL-21-2020

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	IDW DECON WATER / GROUNDWATER	2	DM	700	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: Noises Aragona

SIGNATURE: \_\_\_\_\_

DATE: JUL 21 2020



**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites and Prevention Preparedness and Response Programs**

**Contaminated Media Transport and Treatment or Disposal Approval Form**

<b>DEC HAZARD/SPILL ID #</b>		<b>NAME OF CONTAMINATED SITE OR SPILL</b>	
24042		Former Williams Express Store #5021	
<b>CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION</b>			
6010 Old Seward Highway			
<b>CURRENT PHYSICAL LOCATION OF MEDIA</b>		<b>SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)</b>	
in-situ		USTs	
<b>CONTAMINANTS OF CONCERN</b>		<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>
GRO/DRO/VOCs/PAHs		Five 55-gallon drums	July 6 and 7, 2020
<b>POST TREATMENT ANALYSIS REQUIRED</b> (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)			
<b>COMMENTS OR OTHER IMPORTANT INFORMATION</b>			
Water will be processed in a wastewater treatment unit, recovered fuel will be recycled and recovered oil will be managed under 40CFR Part 279 regulations at NRC Alaska Facility (2020 Viking Drive, Anchorage, AK 99501)			

<b>TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK
<b>RESPONSIBLE PARTY</b>	<b>ADDRESS/PHONE NUMBER</b>
Williams	One Williams CTR, Tulsa, OK 74172
<b>WASTE MANAGEMENT CO. / ORGANIZER</b>	<b>ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK

\*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

**Dan P. McMahon**

Name of the Person Requesting Approval (printed)

**Dan P. McMahon**

Digitally signed by Dan P. McMahon  
DN: cn=Dan P. McMahon, o=Shannon & Wilson,  
ou, email=dxm@shannwil.com, c=US  
Date: 2020.07.02 13:06:17 -08'00'

Signature

**Senior Associate**

Title/Association

**7/2/2020**

Date

**907-433-3223**

Phone Number

**-----DEC USE ONLY-----**

Based on the information provided, ADEC approves transport of the above mentioned material. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

**Grant Lidren**

DEC Project Manager Name (printed)

Signature

**EPS IV**

Project Manager Title

**7/9/2020**

Date

**229-4969**

Phone Number



# NON-HAZARDOUS WASTE MANIFEST

32

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>VSQG</b>		Manifest Document No. <b>153187D</b>	2. Page 1 of <b>1</b>
3. Generator's Name and Mailing Address <b>FORMER WILLIAMS EXPRESS STORE #5021 6010 OLD SEWARD HWY ANCHORAGE, AK 99518</b>		FORMER WILLIAMS EXPRESS STORE #5021 6010 OLD SEWARD HWY ANCHORAGE, AK 99518			
4. Generator's Phone ( )		6. US EPA ID Number <b>AKR000004184</b>		A. State Transporter's ID <b>907-258-1558</b>	
5. Transporter 1 Company Name <b>NRC ALASKA LLC</b>		7. Transporter 2 Company Name		B. Transporter 1 Phone	
9. Designated Facility Name and Site Address <b>NRC ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501</b>		10. US EPA ID Number <b>AKR000004184</b>		C. State Transporter's ID	
				D. Transporter 2 Phone	
				E. State Facility's ID	
				F. Facility's Phone <b>907-258-1558</b>	
11. WASTE DESCRIPTION			Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
HM a. MATERIAL NOT REGULATED BY D.O.T.			1	DM	430 P
b.					
c.					
d.					
G. Additional Descriptions for Materials Listed Above			H. Handling Codes for Wastes Listed Above		
1) EA0302 IDW DECON WATER / GROUNDWATER			D31253		
15. Special Handling Instructions and Additional Information					
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation					
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name <b>Alec Rizzo</b>				Signature <i>[Signature]</i>	
				Date Month Day Year <b>7   17   20</b>	
17. Transporter 1 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name <i>[Signature]</i>				Signature <i>[Signature]</i>	
				Date Month Day Year <b>7   17   20</b>	
18. Transporter 2 Acknowledgement of Receipt of Materials				Date	
Printed/Typed Name				Signature	
				Month Day Year	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.					
Printed/Typed Name <b>Patricia L. Beasley</b>				Signature <i>[Signature]</i>	
				Date Month Day Year <b>07 20 20</b>	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY





# CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: FORMER WILLIAMS EXPRESS STORE #5021  
6010 OLD SEWARD HWY  
ANCHORAGE, AK 99518

DISPOSAL FACILITY: NRC ALASKA LLC  
2020 VIKING DRIVE  
ANCHORAGE, AK 99501

EPA ID NUMBER: VSQG  
MANIFEST/DOCUMENT #: 153187D  
DATE OF DISPOSAL/RECYCLE: JUL-20-2020

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	IDW DECON WATER / GROUNDWATER	1	DM	430	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: FLB

SIGNATURE: Patricia J. Beasley

JUL 20 2020

DATE: \_\_\_\_\_



**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites and Prevention Preparedness and Response Programs**

**Contaminated Media Transport and Treatment or Disposal Approval Form**

<b>DEC HAZARD/SPILL ID #</b>		<b>NAME OF CONTAMINATED SITE OR SPILL</b>	
24042		Former Williams Express Store #5021	
<b>CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION</b>			
6010 Old Seward Highway			
<b>CURRENT PHYSICAL LOCATION OF MEDIA</b>		<b>SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)</b>	
in-situ		USTs	
<b>CONTAMINANTS OF CONCERN</b>		<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>
GRO/DRO/VOCs/PAHs		Five 55-gallon drums	July 6 and 7, 2020
<b>POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)</b>			
<b>COMMENTS OR OTHER IMPORTANT INFORMATION</b>			
Water will be processed in a wastewater treatment unit, recovered fuel will be recycled and recovered oil will be managed under 40CFR Part 279 regulations at NRC Alaska Facility (2020 Viking Drive, Anchorage, AK 99501)			

<b>TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK
<b>RESPONSIBLE PARTY</b>	<b>ADDRESS/PHONE NUMBER</b>
Williams	One Williams CTR, Tulsa, OK 74172
<b>WASTE MANAGEMENT CO. / ORGANIZER</b>	<b>ADDRESS/PHONE NUMBER</b>
NRC Alaska	2020 Viking Drive, Anchorage, AK

\*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

**Dan P. McMahon**

Name of the Person Requesting Approval (printed)

**Dan P. McMahon**

Digitally signed by Dan P. McMahon  
DN: cn=Dan P. McMahon, o=Shannon & Wilson,  
ou, email=dxm@sharwil.com, c=US  
Date: 2020.07.02 13:06:17 -08'00'

Signature

**Senior Associate**

Title/Association

**7/2/2020**

Date

**907-433-3223**

Phone Number

-----DEC USE ONLY-----

Based on the information provided, ADEC approves transport of the above mentioned material. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

**Grant Lidren**

DEC Project Manager Name (printed)

*Grant Lidren*

Signature

**EPS IV**

Project Manager Title

**7/9/2020**

Date

**229-4969**

Phone Number



# NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>VSQG</b>		Manifest Document No. <b>153187E</b>	2. Page 1 of <b>1</b>
3. Generator's Name and Mailing Address <b>FORMER WILLIAMS EXPRESS STORE #5021 6010 OLD SEWARD HWY ANCHORAGE, AK 99518</b>		FORMER WILLIAMS EXPRESS STORE #502' 6010 OLD SEWARD HWY ANCHORAGE, AK 99518			
4. Generator's Phone ( )					
5. Transporter 1 Company Name <b>CLIENT DELIVERED</b>		6. US EPA ID Number		A. State Transporter's ID	
7. Transporter 2 Company Name		8. US EPA ID Number		B. Transporter 1 Phone	
9. Designated Facility Name and Site Address <b>NRC ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501</b>		10. US EPA ID Number <b>AKR000004184</b>		C. State Transporter's ID	
				D. Transporter 2 Phone	
				E. State Facility's ID	
				F. Facility's Phone <b>907-258-1558</b>	
11. WASTE DESCRIPTION			Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
HM a. MATERIAL NOT REGULATED BY D.O.T.			1	DM	371 P
b.					
c.					
d.					
G. Additional Descriptions for Materials Listed Above 1) EA0302 IDW DECON WATER / GROUNDWATER			H. Handling Codes for Wastes Listed Above D01446		
15. Special Handling Instructions and Additional Information  Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation					
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name		Signature		Date	
⊗ Alec Rizzo		<i>[Signature]</i>		7   29   20	
17. Transporter 1 Acknowledgement of Receipt of Materials					
Printed/Typed Name		Signature		Date	
⊗ Alec Rizzo		<i>[Signature]</i>		7   29   20	
18. Transporter 2 Acknowledgement of Receipt of Materials					
Printed/Typed Name		Signature		Date	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.					
Printed/Typed Name		Signature		Date	
Patrickal Beasley		<i>[Signature]</i>		07   2020	

NON-HAZARDOUS WASTE

TRANSPORTER

FACILITY



# CERTIFICATE OF DISPOSAL/RECYCLE

**GENERATOR:** FORMER WILLIAMS EXPRESS STORE #5021  
6010 OLD SEWARD HWY  
ANCHORAGE, AK 99518

**DISPOSAL FACILITY:** NRC ALASKA LLC  
2020 VIKING DRIVE  
ANCHORAGE, AK 99501

**EPA ID NUMBER:** VSQG  
**MANIFEST/DOCUMENT #:** 153187E  
**DATE OF DISPOSAL/RECYCLE:** JUL-30-2020

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	IDW DECON WATER / GROUNDWATER	1	DM	371	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

**PREPARED BY:** FLB  
**SIGNATURE:** Dawn Beasley

JUL 30 2020

**DATE:** \_\_\_\_\_

**APPENDIX E**  
**RESULTS OF ANALYTICAL TESTING BY SGS NORTH AMERICA INC.**  
**AND**  
**ADEC LABORATORY DATA REVIEW CHECKLISTS**

## Laboratory Report of Analysis

To: Shannon & Wilson, Inc.  
5430 Fairbanks Street, Suite 3  
Anchorage, AK 99518  
561-2120

Report Number: **1203155**

Client Project: **101293 WES5021**

Dear Stephanie Dow,

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: **1203155**

Project Name/Site: **101293 WES5021**

Project Contact: **Stephanie Dow**

Refer to sample receipt form for information on sample condition.

### **LCS for HBN 1808714 [VXX/35915 (1568342) LCS**

8260D - LCS recovery for 2,2-dichloropropane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

### **1203257001MS (1568343) MS**

8260D - MS recovery for 2,2-dichloropropane does not meet QC criteria. This analyte was not detected above the LOQ in the parent sample.

### **1203257001MSD (1568344) MSD**

8260D - MSD recovery for 2,2-dichloropropane does not meet QC criteria. This analyte was not detected above the LOQ in the parent sample.

\*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: 07/21/2020 3:34:55PM

## 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
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>
101293-B45S8	1203155001	06/30/2020	07/02/2020	Soil/Solid (dry weight)
101293-B46S8	1203155002	06/30/2020	07/02/2020	Soil/Solid (dry weight)
101293-B47S4	1203155003	07/01/2020	07/02/2020	Soil/Solid (dry weight)
101293-B48S5	1203155004	07/01/2020	07/02/2020	Soil/Solid (dry weight)
101293-B49S6	1203155005	07/01/2020	07/02/2020	Soil/Solid (dry weight)
101293-STB	1203155006	06/30/2020	07/02/2020	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel Range Organics (S)
AK101	Gasoline Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260D	VOC 8260 (S) Field Extracted

Print Date: 07/21/2020 3:34:58PM

### Detectable Results Summary

Client Sample ID: **101293-B45S8**

Lab Sample ID: 1203155001

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.63J	mg/Kg
Gasoline Range Organics	0.992J	mg/Kg

Client Sample ID: **101293-B46S8**

Lab Sample ID: 1203155002

**Semivolatile Organic Fuels**

**Volatile Fuels**

**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.38J	mg/Kg
Gasoline Range Organics	2.67J	mg/Kg
Benzene	233	ug/Kg
Ethylbenzene	16.9J	ug/Kg
P & M -Xylene	24.8J	ug/Kg
Toluene	16.3J	ug/Kg

Client Sample ID: **101293-B47S4**

Lab Sample ID: 1203155003

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	9.86J	mg/Kg
Gasoline Range Organics	1.11J	mg/Kg

Client Sample ID: **101293-B48S5**

Lab Sample ID: 1203155004

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.36J	mg/Kg



**Results of 101293-B45S8**

Client Sample ID: **101293-B45S8**  
 Client Project ID: **101293 WES5021**  
 Lab Sample ID: 1203155001  
 Lab Project ID: 1203155

Collection Date: 06/30/20 10:24  
 Received Date: 07/02/20 16:30  
 Matrix: Soil/Solid (dry weight)  
 Solids (%):91.4  
 Location:

**Results by Semivolatile Organic Fuels**

<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>
Diesel Range Organics	8.63 J	21.7	6.74	mg/Kg	1		07/16/20 13:51
<b>Surrogates</b>							
5a Androstane (surr)	90.8	50-150		%	1		07/16/20 13:51

**Batch Information**

Analytical Batch: XFC15656  
 Analytical Method: AK102  
 Analyst: CDM  
 Analytical Date/Time: 07/16/20 13:51  
 Container ID: 1203155001-A

Prep Batch: XXX43422  
 Prep Method: SW3550C  
 Prep Date/Time: 07/09/20 10:01  
 Prep Initial Wt./Vol.: 30.203 g  
 Prep Extract Vol: 5 mL



Results of 101293-B45S8

Client Sample ID: 101293-B45S8
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155001
Lab Project ID: 1203155

Collection Date: 06/30/20 10:24
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):91.4
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.992 J, 2.82, 0.847, mg/Kg, 1, 07/08/20 04:18

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 85.9, 50-150, %, 1, 07/08/20 04:18

Batch Information

Analytical Batch: VFC15221
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 07/08/20 04:18
Container ID: 1203155001-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 06/30/20 10:24
Prep Initial Wt./Vol.: 58.133 g
Prep Extract Vol: 30.0035 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 92.6, 72-119, %, 1, 07/08/20 04:18

Batch Information

Analytical Batch: VFC15221
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 07/08/20 04:18
Container ID: 1203155001-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 06/30/20 10:24
Prep Initial Wt./Vol.: 58.133 g
Prep Extract Vol: 30.0035 mL



Results of 101293-B46S8

Client Sample ID: 101293-B46S8
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155002
Lab Project ID: 1203155

Collection Date: 06/30/20 14:59
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):90.6
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate standards.

Batch Information

Analytical Batch: XMS12123
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 07/10/20 13:43
Container ID: 1203155002-A

Prep Batch: XXX43423
Prep Method: SW3550C
Prep Date/Time: 07/09/20 11:49
Prep Initial Wt./Vol.: 22.991 g
Prep Extract Vol: 5 mL



Results of **101293-B46S8**

Client Sample ID: **101293-B46S8**  
Client Project ID: **101293 WES5021**  
Lab Sample ID: 1203155002  
Lab Project ID: 1203155

Collection Date: 06/30/20 14:59  
Received Date: 07/02/20 16:30  
Matrix: Soil/Solid (dry weight)  
Solids (%):90.6  
Location:

Results by **Semivolatile Organic Fuels**

<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>
Diesel Range Organics	8.38 J	22.0	6.84	mg/Kg	1		07/16/20 14:01
<b>Surrogates</b>							
5a Androstane (surr)	88.8	50-150		%	1		07/16/20 14:01

**Batch Information**

Analytical Batch: XFC15656  
Analytical Method: AK102  
Analyst: CDM  
Analytical Date/Time: 07/16/20 14:01  
Container ID: 1203155002-A

Prep Batch: XXX43422  
Prep Method: SW3550C  
Prep Date/Time: 07/09/20 10:01  
Prep Initial Wt./Vol.: 30.023 g  
Prep Extract Vol: 5 mL



Results of **101293-B46S8**

Client Sample ID: **101293-B46S8**  
Client Project ID: **101293 WES5021**  
Lab Sample ID: 1203155002  
Lab Project ID: 1203155

Collection Date: 06/30/20 14:59  
Received Date: 07/02/20 16:30  
Matrix: Soil/Solid (dry weight)  
Solids (%):90.6  
Location:

Results by **Volatile Fuels**

<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>
Gasoline Range Organics	2.67 J	3.27	0.981	mg/Kg	1		07/08/20 05:12
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	70	50-150		%	1		07/08/20 05:12

Batch Information

Analytical Batch: VFC15221  
Analytical Method: AK101  
Analyst: ALJ  
Analytical Date/Time: 07/08/20 05:12  
Container ID: 1203155002-B

Prep Batch: VXX35906  
Prep Method: SW5035A  
Prep Date/Time: 06/30/20 14:59  
Prep Initial Wt./Vol.: 50.071 g  
Prep Extract Vol: 29.6885 mL



Results of 101293-B46S8

Client Sample ID: 101293-B46S8
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155002
Lab Project ID: 1203155

Collection Date: 06/30/20 14:59
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):90.6
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 07/21/2020 3:35:01PM

J flagging is activated



**Results of 101293-B46S8**

Client Sample ID: **101293-B46S8**  
 Client Project ID: **101293 WES5021**  
 Lab Sample ID: 1203155002  
 Lab Project ID: 1203155

Collection Date: 06/30/20 14:59  
 Received Date: 07/02/20 16:30  
 Matrix: Soil/Solid (dry weight)  
 Solids (%):90.6  
 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>
Chloroethane	131 U	262	81.1	ug/Kg	1		07/09/20 16:15
Chloroform	2.62 U	5.23	0.811	ug/Kg	1		07/09/20 16:15
Chloromethane	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
cis-1,2-Dichloroethene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
cis-1,3-Dichloropropene	8.20 U	16.4	5.10	ug/Kg	1		07/09/20 16:15
Dibromochloromethane	3.27 U	6.54	0.811	ug/Kg	1		07/09/20 16:15
Dibromomethane	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
Dichlorodifluoromethane	32.7 U	65.4	19.6	ug/Kg	1		07/09/20 16:15
Ethylbenzene	16.9 J	32.7	10.2	ug/Kg	1		07/09/20 16:15
Freon-113	65.5 U	131	40.6	ug/Kg	1		07/09/20 16:15
Hexachlorobutadiene	13.1 U	26.2	8.11	ug/Kg	1		07/09/20 16:15
Isopropylbenzene (Cumene)	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
Methylene chloride	65.5 U	131	40.6	ug/Kg	1		07/09/20 16:15
Methyl-t-butyl ether	65.5 U	131	40.6	ug/Kg	1		07/09/20 16:15
Naphthalene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
n-Butylbenzene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
n-Propylbenzene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
o-Xylene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
P & M -Xylene	24.8 J	65.4	19.6	ug/Kg	1		07/09/20 16:15
sec-Butylbenzene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
Styrene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
tert-Butylbenzene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
Tetrachloroethene	8.20 U	16.4	5.10	ug/Kg	1		07/09/20 16:15
Toluene	16.3 J	32.7	10.2	ug/Kg	1		07/09/20 16:15
trans-1,2-Dichloroethene	16.4 U	32.7	10.2	ug/Kg	1		07/09/20 16:15
trans-1,3-Dichloropropene	8.20 U	16.4	5.10	ug/Kg	1		07/09/20 16:15
Trichloroethene	3.27 U	6.54	1.96	ug/Kg	1		07/09/20 16:15
Trichlorofluoromethane	32.7 U	65.4	19.6	ug/Kg	1		07/09/20 16:15
Vinyl acetate	65.5 U	131	40.6	ug/Kg	1		07/09/20 16:15
Vinyl chloride	0.525 U	1.05	0.327	ug/Kg	1		07/09/20 16:15
Xylenes (total)	49.0 U	98.1	29.8	ug/Kg	1		07/09/20 16:15
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/20 16:15
4-Bromofluorobenzene (surr)	102	55-151		%	1		07/09/20 16:15
Toluene-d8 (surr)	96.2	85-116		%	1		07/09/20 16:15



## Results of 101293-B46S8

Client Sample ID: **101293-B46S8**  
Client Project ID: **101293 WES5021**  
Lab Sample ID: 1203155002  
Lab Project ID: 1203155

Collection Date: 06/30/20 14:59  
Received Date: 07/02/20 16:30  
Matrix: Soil/Solid (dry weight)  
Solids (%):90.6  
Location:

## Results by Volatile GC/MS

### Batch Information

Analytical Batch: VMS20083  
Analytical Method: SW8260D  
Analyst: KAJ  
Analytical Date/Time: 07/09/20 16:15  
Container ID: 1203155002-B

Prep Batch: VXX35915  
Prep Method: SW5035A  
Prep Date/Time: 06/30/20 14:59  
Prep Initial Wt./Vol.: 50.071 g  
Prep Extract Vol: 29.6885 mL



Results of **101293-B47S4**

Client Sample ID: **101293-B47S4**  
Client Project ID: **101293 WES5021**  
Lab Sample ID: 1203155003  
Lab Project ID: 1203155

Collection Date: 07/01/20 09:01  
Received Date: 07/02/20 16:30  
Matrix: Soil/Solid (dry weight)  
Solids (%):92.2  
Location:

Results by **Semivolatile Organic Fuels**

<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>
Diesel Range Organics	9.86 J	21.4	6.63	mg/Kg	1		07/16/20 14:11
<b>Surrogates</b>							
5a Androstane (surr)	91.5	50-150		%	1		07/16/20 14:11

**Batch Information**

Analytical Batch: XFC15656  
Analytical Method: AK102  
Analyst: CDM  
Analytical Date/Time: 07/16/20 14:11  
Container ID: 1203155003-A

Prep Batch: XXX43422  
Prep Method: SW3550C  
Prep Date/Time: 07/09/20 10:01  
Prep Initial Wt./Vol.: 30.438 g  
Prep Extract Vol: 5 mL



Results of 101293-B47S4

Client Sample ID: 101293-B47S4
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155003
Lab Project ID: 1203155

Collection Date: 07/01/20 09:01
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 1.11 J, 2.98, 0.894, mg/Kg, 1, 07/08/20 05:30

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 85.4, 50-150, %, 1, 07/08/20 05:30

Batch Information

Analytical Batch: VFC15221
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 07/08/20 05:30
Container ID: 1203155003-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 07/01/20 09:01
Prep Initial Wt./Vol.: 52.965 g
Prep Extract Vol: 29.1115 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 93.3, 72-119, %, 1, 07/08/20 05:30

Batch Information

Analytical Batch: VFC15221
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 07/08/20 05:30
Container ID: 1203155003-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 07/01/20 09:01
Prep Initial Wt./Vol.: 52.965 g
Prep Extract Vol: 29.1115 mL



Results of **101293-B48S5**

Client Sample ID: **101293-B48S5**  
Client Project ID: **101293 WES5021**  
Lab Sample ID: 1203155004  
Lab Project ID: 1203155

Collection Date: 07/01/20 12:30  
Received Date: 07/02/20 16:30  
Matrix: Soil/Solid (dry weight)  
Solids (%):82.6  
Location:

Results by **Semivolatile Organic Fuels**

<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>
Diesel Range Organics	8.36 J	23.9	7.42	mg/Kg	1		07/16/20 14:21
<b>Surrogates</b>							
5a Androstane (surr)	92	50-150		%	1		07/16/20 14:21

**Batch Information**

Analytical Batch: XFC15656  
Analytical Method: AK102  
Analyst: CDM  
Analytical Date/Time: 07/16/20 14:21  
Container ID: 1203155004-A

Prep Batch: XXX43422  
Prep Method: SW3550C  
Prep Date/Time: 07/09/20 10:01  
Prep Initial Wt./Vol.: 30.376 g  
Prep Extract Vol: 5 mL



Results of 101293-B48S5

Client Sample ID: 101293-B48S5
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155004
Lab Project ID: 1203155

Collection Date: 07/01/20 12:30
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):82.6
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 1.81 U, 3.63, 1.09, mg/Kg, 1, 07/08/20 06:23

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 74.2, 50-150, %, 1, 07/08/20 06:23

Batch Information

Analytical Batch: VFC15221
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 07/08/20 06:23
Container ID: 1203155004-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 07/01/20 12:30
Prep Initial Wt./Vol.: 58.911 g
Prep Extract Vol: 35.2725 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 93.7, 72-119, %, 1, 07/08/20 06:23

Batch Information

Analytical Batch: VFC15221
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 07/08/20 06:23
Container ID: 1203155004-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 07/01/20 12:30
Prep Initial Wt./Vol.: 58.911 g
Prep Extract Vol: 35.2725 mL

**Results of 101293-B49S6**

Client Sample ID: **101293-B49S6**  
 Client Project ID: **101293 WES5021**  
 Lab Sample ID: 1203155005  
 Lab Project ID: 1203155

Collection Date: 07/01/20 16:02  
 Received Date: 07/02/20 16:30  
 Matrix: Soil/Solid (dry weight)  
 Solids (%):89.5  
 Location:

**Results by Semivolatile Organic Fuels**

<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>
Diesel Range Organics	11.2 U	22.3	6.92	mg/Kg	1		07/16/20 14:31
<b>Surrogates</b>							
5a Androstane (surr)	78.1	50-150		%	1		07/16/20 14:31

**Batch Information**

Analytical Batch: XFC15656  
 Analytical Method: AK102  
 Analyst: CDM  
 Analytical Date/Time: 07/16/20 14:31  
 Container ID: 1203155005-A

Prep Batch: XXX43422  
 Prep Method: SW3550C  
 Prep Date/Time: 07/09/20 10:01  
 Prep Initial Wt./Vol.: 30.034 g  
 Prep Extract Vol: 5 mL



Results of 101293-B49S6

Client Sample ID: 101293-B49S6
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155005
Lab Project ID: 1203155

Collection Date: 07/01/20 16:02
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):89.5
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 1.18 U, 2.36, 0.708, mg/Kg, 1, 07/08/20 06:41

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 49.8 \*, 50-150, %, 1, 07/08/20 06:41

Batch Information

Analytical Batch: VFC15221
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 07/08/20 06:41
Container ID: 1203155005-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 07/01/20 16:02
Prep Initial Wt./Vol.: 78.679 g
Prep Extract Vol: 33.253 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 93.5, 72-119, %, 1, 07/08/20 06:41

Batch Information

Analytical Batch: VFC15221
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 07/08/20 06:41
Container ID: 1203155005-B

Prep Batch: VXX35906
Prep Method: SW5035A
Prep Date/Time: 07/01/20 16:02
Prep Initial Wt./Vol.: 78.679 g
Prep Extract Vol: 33.253 mL



## Results of 101293-STB

Client Sample ID: **101293-STB**  
 Client Project ID: **101293 WES5021**  
 Lab Sample ID: 1203155006  
 Lab Project ID: 1203155

Collection Date: 06/30/20 10:24  
 Received Date: 07/02/20 16:30  
 Matrix: Soil/Solid (dry weight)  
 Solids (%):  
 Location:

## Results by Volatile Fuels

<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>
Gasoline Range Organics	1.25 U	2.51	0.754	mg/Kg	1		07/08/20 00:26
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	82.3	50-150		%	1		07/08/20 00:26

## Batch Information

Analytical Batch: VFC15221  
 Analytical Method: AK101  
 Analyst: ALJ  
 Analytical Date/Time: 07/08/20 00:26  
 Container ID: 1203155006-A

Prep Batch: VXX35906  
 Prep Method: SW5035A  
 Prep Date/Time: 06/30/20 10:24  
 Prep Initial Wt./Vol.: 49.71 g  
 Prep Extract Vol: 25 mL



Results of 101293-STB

Client Sample ID: 101293-STB
Client Project ID: 101293 WES5021
Lab Sample ID: 1203155006
Lab Project ID: 1203155

Collection Date: 06/30/20 10:24
Received Date: 07/02/20 16:30
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



**Results of 101293-STB**

Client Sample ID: **101293-STB**  
 Client Project ID: **101293 WES5021**  
 Lab Sample ID: 1203155006  
 Lab Project ID: 1203155

Collection Date: 06/30/20 10:24  
 Received Date: 07/02/20 16:30  
 Matrix: Soil/Solid (dry weight)  
 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>
Chloroethane	101 U	201	62.4	ug/Kg	1		07/09/20 14:20
Chloroform	2.01 U	4.02	1.01	ug/Kg	1		07/09/20 14:20
Chloromethane	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
cis-1,2-Dichloroethene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
cis-1,3-Dichloropropene	6.30 U	12.6	3.92	ug/Kg	1		07/09/20 14:20
Dibromochloromethane	2.52 U	5.03	1.51	ug/Kg	1		07/09/20 14:20
Dibromomethane	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
Dichlorodifluoromethane	25.1 U	50.3	15.1	ug/Kg	1		07/09/20 14:20
Ethylbenzene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
Freon-113	50.5 U	101	31.2	ug/Kg	1		07/09/20 14:20
Hexachlorobutadiene	10.1 U	20.1	6.24	ug/Kg	1		07/09/20 14:20
Isopropylbenzene (Cumene)	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
Methylene chloride	50.5 U	101	31.2	ug/Kg	1		07/09/20 14:20
Methyl-t-butyl ether	50.5 U	101	31.2	ug/Kg	1		07/09/20 14:20
Naphthalene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
n-Butylbenzene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
n-Propylbenzene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
o-Xylene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
P & M -Xylene	25.1 U	50.3	15.1	ug/Kg	1		07/09/20 14:20
sec-Butylbenzene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
Styrene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
tert-Butylbenzene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
Tetrachloroethene	6.30 U	12.6	3.92	ug/Kg	1		07/09/20 14:20
Toluene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
trans-1,2-Dichloroethene	12.6 U	25.1	7.85	ug/Kg	1		07/09/20 14:20
trans-1,3-Dichloropropene	6.30 U	12.6	3.92	ug/Kg	1		07/09/20 14:20
Trichloroethene	2.52 U	5.03	1.51	ug/Kg	1		07/09/20 14:20
Trichlorofluoromethane	25.1 U	50.3	15.1	ug/Kg	1		07/09/20 14:20
Vinyl acetate	50.5 U	101	31.2	ug/Kg	1		07/09/20 14:20
Vinyl chloride	0.403 U	0.805	0.251	ug/Kg	1		07/09/20 14:20
Xylenes (total)	37.7 U	75.4	22.9	ug/Kg	1		07/09/20 14:20
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	110	71-136		%	1		07/09/20 14:20
4-Bromofluorobenzene (surr)	95.9	55-151		%	1		07/09/20 14:20
Toluene-d8 (surr)	95.8	85-116		%	1		07/09/20 14:20

Print Date: 07/21/2020 3:35:01PM

J flagging is activated

## Results of 101293-STB

Client Sample ID: **101293-STB**  
Client Project ID: **101293 WES5021**  
Lab Sample ID: 1203155006  
Lab Project ID: 1203155

Collection Date: 06/30/20 10:24  
Received Date: 07/02/20 16:30  
Matrix: Soil/Solid (dry weight)  
Solids (%):  
Location:

## Results by Volatile GC/MS

### Batch Information

Analytical Batch: VMS20083  
Analytical Method: SW8260D  
Analyst: KAJ  
Analytical Date/Time: 07/09/20 14:20  
Container ID: 1203155006-A

Prep Batch: VXX35915  
Prep Method: SW5035A  
Prep Date/Time: 06/30/20 10:24  
Prep Initial Wt./Vol.: 49.71 g  
Prep Extract Vol: 25 mL

## Method Blank

Blank ID: MB for HBN 1808603 [SPT/11071]  
Blank Lab ID: 1567887

Matrix: Soil/Solid (dry weight)

QC for Samples:  
1203155001, 1203155002, 1203155003, 1203155004, 1203155005

## Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

## Batch Information

Analytical Batch: SPT11071  
Analytical Method: SM21 2540G  
Instrument:  
Analyst: AEQ  
Analytical Date/Time: 7/7/2020 5:30:00PM

Print Date: 07/21/2020 3:35:02PM

## Duplicate Sample Summary

Original Sample ID: 1203108008  
Duplicate Sample ID: 1567889  
QC for Samples:

Analysis Date: 07/07/2020 17:30  
Matrix: Soil/Solid (dry weight)

## Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	95.3	95.2	%	0.17	(< 15 )

## Batch Information

Analytical Batch: SPT11071  
Analytical Method: SM21 2540G  
Instrument:  
Analyst: AEQ

Print Date: 07/21/2020 3:35:03PM

## Duplicate Sample Summary

Original Sample ID: 1203134023

Duplicate Sample ID: 1567890

QC for Samples:

1203155001, 1203155002, 1203155003, 1203155004, 1203155005

Analysis Date: 07/07/2020 17:30

Matrix: Soil/Solid (dry weight)

## Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	90.1	90.0	%	0.08	(< 15 )

## Batch Information

Analytical Batch: SPT11071

Analytical Method: SM21 2540G

Instrument:

Analyst: AEQ

Print Date: 07/21/2020 3:35:03PM

## Duplicate Sample Summary

Original Sample ID: 1209419003

Duplicate Sample ID: 1567891

QC for Samples:

1203155001, 1203155002, 1203155003, 1203155004, 1203155005

Analysis Date: 07/07/2020 17:30

Matrix: Soil/Solid (dry weight)

## Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	82.9	85.4	%	3.00	(< 15 )

## Batch Information

Analytical Batch: SPT11071

Analytical Method: SM21 2540G

Instrument:

Analyst: AEQ

Print Date: 07/21/2020 3:35:03PM



## Method Blank

Blank ID: MB for HBN 1808635 [VXX/35906]  
 Blank Lab ID: 1567984

Matrix: Soil/Solid (dry weight)

QC for Samples:  
 1203155001, 1203155002, 1203155003, 1203155004, 1203155005, 1203155006

## Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
Gasoline Range Organics	1.28J	2.50	0.750	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Xylenes (total)	0.0375U	0.0750	0.0228	mg/Kg
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	97	72-119		%
4-Bromofluorobenzene (surr)	70.1	50-150		%

## Batch Information

Analytical Batch: VFC15221  
 Analytical Method: AK101  
 Instrument: Agilent 7890A PID/FID  
 Analyst: ALJ  
 Analytical Date/Time: 7/7/2020 11:50:00PM

Prep Batch: VXX35906  
 Prep Method: SW5035A  
 Prep Date/Time: 7/7/2020 6:00:00AM  
 Prep Initial Wt./Vol.: 50 g  
 Prep Extract Vol: 25 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [VXX35906]  
 Blank Spike Lab ID: 1567985  
 Date Analyzed: 07/07/2020 22:39

Spike Duplicate ID: LCSD for HBN 1203155 [VXX35906]  
 Spike Duplicate Lab ID: 1567986  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155001, 1203155002, 1203155003, 1203155004, 1203155005, 1203155006

## Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.0	104	12.5	12.5	100	( 60-120 )	3.50	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	1.25	84.8	85	1.25	83.4	83	( 50-150 )	1.70	
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## Batch Information

Analytical Batch: **VFC15221**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **ALJ**

Prep Batch: **VXX35906**  
 Prep Method: **SW5035A**  
 Prep Date/Time: **07/07/2020 06:00**  
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL  
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 07/21/2020 3:35:07PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [VXX35906]  
 Blank Spike Lab ID: 1568001  
 Date Analyzed: 07/07/2020 23:15

Spike Duplicate ID: LCSD for HBN 1203155 [VXX35906]  
 Spike Duplicate Lab ID: 1568002  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155001, 1203155002, 1203155003, 1203155004, 1203155005, 1203155006

## Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1.25	1.25	100	1.25	1.30	104	( 75-125 )	4.20	(< 20 )
Ethylbenzene	1.25	1.18	94	1.25	1.20	96	( 75-125 )	2.00	(< 20 )
o-Xylene	1.25	1.11	89	1.25	1.12	90	( 75-125 )	1.00	(< 20 )
P & M -Xylene	2.50	2.28	91	2.50	2.35	94	( 80-125 )	2.70	(< 20 )
Toluene	1.25	1.30	104	1.25	1.33	106	( 70-125 )	2.20	(< 20 )
Xylenes (total)	3.75	3.39	91	3.75	3.47	92	( 78-124 )	2.10	(< 20 )

## Surrogates

1,4-Difluorobenzene (surr)	1.25	99.5	100	1.25	101	101	( 72-119 )	1.90	
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## Batch Information

Analytical Batch: VFC15221  
 Analytical Method: AK101  
 Instrument: Agilent 7890A PID/FID  
 Analyst: ALJ

Prep Batch: VXX35906  
 Prep Method: SW5035A  
 Prep Date/Time: 07/07/2020 06:00  
 Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL  
 Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

## Method Blank

Blank ID: MB for HBN 1808635 [VXX/35906]  
 Blank Lab ID: 1567984

Matrix: Soil/Solid (dry weight)

QC for Samples:  
 1203155001, 1203155002, 1203155003, 1203155004, 1203155005, 1203155006

## Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	97	72-119		%

## Batch Information

Analytical Batch: VFC15221  
 Analytical Method: SW8021B  
 Instrument: Agilent 7890A PID/FID  
 Analyst: ALJ  
 Analytical Date/Time: 7/7/2020 11:50:00PM

Prep Batch: VXX35906  
 Prep Method: SW5035A  
 Prep Date/Time: 7/7/2020 6:00:00AM  
 Prep Initial Wt./Vol.: 50 g  
 Prep Extract Vol: 25 mL

Print Date: 07/21/2020 3:35:09PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [VXX35906]  
 Blank Spike Lab ID: 1568001  
 Date Analyzed: 07/07/2020 23:15

Spike Duplicate ID: LCSD for HBN 1203155 [VXX35906]  
 Spike Duplicate Lab ID: 1568002  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155001, 1203155002, 1203155003, 1203155004, 1203155005, 1203155006

## Results by SW8021B

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1250	1250	100	1250	1300	104	( 75-125 )	4.20	(< 20 )
Ethylbenzene	1250	1180	94	1250	1200	96	( 75-125 )	2.00	(< 20 )
o-Xylene	1250	1110	89	1250	1120	90	( 75-125 )	1.00	(< 20 )
P & M -Xylene	2500	2280	91	2500	2350	94	( 80-125 )	2.70	(< 20 )
Toluene	1250	1300	104	1250	1330	106	( 70-125 )	2.20	(< 20 )
Xylenes (total)	3750	3390	91	3750	3470	92	( 78-124 )	2.10	(< 20 )

## Surrogates

1,4-Difluorobenzene (surr)	1250	99.5	100	1250	101	101	( 72-119 )	1.90	
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## Batch Information

Analytical Batch: **VFC15221**  
 Analytical Method: **SW8021B**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **ALJ**

Prep Batch: **VXX35906**  
 Prep Method: **SW5035A**  
 Prep Date/Time: **07/07/2020 06:00**  
 Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL  
 Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL



### Matrix Spike Summary

Original Sample ID: 1203155003  
MS Sample ID: 1568033 MS  
MSD Sample ID: 1568034 MSD

Analysis Date: 07/08/2020 5:30  
Analysis Date: 07/08/2020 5:47  
Analysis Date: 07/08/2020 6:05  
Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155001, 1203155002, 1203155003, 1203155004, 1203155005, 1203155006

### Results by SW8021B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	7.45U	1280	1280	100	1280	1323	103	75-125	3.30	(< 20 )
Ethylbenzene	14.9U	1280	1323	103	1280	1367	107	75-125	3.20	(< 20 )
o-Xylene	14.9U	1280	1236	96	1280	1291	101	75-125	4.80	(< 20 )
P & M -Xylene	29.8U	2560	2570	100	2560	2668	104	80-125	4.00	(< 20 )
Toluene	14.9U	1280	1367	107	1280	1399	109	70-125	2.30	(< 20 )
Xylenes (total)	44.7U	3839	3796	99	3839	3970	103	78-124	4.30	(< 20 )
<b>Surrogates</b>										
1,4-Difluorobenzene (surr)		1280	1247	98	1280	1269	99	72-119	0.98	

### Batch Information

Analytical Batch: VFC15221  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: ALJ  
Analytical Date/Time: 7/8/2020 5:47:00AM

Prep Batch: VXX35906  
Prep Method: AK101 Extraction (S)  
Prep Date/Time: 7/7/2020 6:00:00AM  
Prep Initial Wt./Vol.: 52.97g  
Prep Extract Vol: 25.00mL

Print Date: 07/21/2020 3:35:13PM

## Method Blank

Blank ID: MB for HBN 1808714 [VXX/35915]

Blank Lab ID: 1568341

QC for Samples:

1203155002, 1203155006

Matrix: Soil/Solid (dry weight)

## Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,1,1,2-Tetrachloroethane	10.0U	20.0	6.20	ug/Kg
1,1,1-Trichloroethane	12.5U	25.0	7.80	ug/Kg
1,1,2,2-Tetrachloroethane	1.00U	2.00	0.620	ug/Kg
1,1,2-Trichloroethane	0.400U	0.800	0.250	ug/Kg
1,1-Dichloroethane	12.5U	25.0	7.80	ug/Kg
1,1-Dichloroethene	12.5U	25.0	7.80	ug/Kg
1,1-Dichloropropene	12.5U	25.0	7.80	ug/Kg
1,2,3-Trichlorobenzene	25.0U	50.0	15.0	ug/Kg
1,2,3-Trichloropropane	1.00U	2.00	0.620	ug/Kg
1,2,4-Trichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,4-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
2,2-Dichloropropane	12.5U	25.0	7.80	ug/Kg
2-Butanone (MEK)	125U	250	78.0	ug/Kg
2-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
2-Hexanone	50.0U	100	31.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	50.0U	100	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Acetone	125U	250	78.0	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Bromobenzene	12.5U	25.0	7.80	ug/Kg
Bromochloromethane	12.5U	25.0	7.80	ug/Kg
Bromodichloromethane	1.00U	2.00	0.620	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Bromomethane	10.0U	20.0	6.20	ug/Kg
Carbon disulfide	50.0U	100	31.0	ug/Kg
Carbon tetrachloride	6.25U	12.5	3.90	ug/Kg
Chlorobenzene	12.5U	25.0	7.80	ug/Kg
Chloroethane	100U	200	62.0	ug/Kg

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## Method Blank

Blank ID: MB for HBN 1808714 [VXX/35915]  
 Blank Lab ID: 1568341

Matrix: Soil/Solid (dry weight)

QC for Samples:  
 1203155002, 1203155006

## Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Chloroform	2.00U	4.00	0.620	ug/Kg
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Dibromochloromethane	2.50U	5.00	0.620	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	10.0U	20.0	6.20	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Trichloroethene	2.50U	5.00	1.50	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	0.400U	0.800	0.250	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	110	71-136		%
4-Bromofluorobenzene (surr)	100	55-151		%
Toluene-d8 (surr)	97.7	85-116		%





**Method Blank**

Blank ID: MB for HBN 1808714 [VXX/35915]  
Blank Lab ID: 1568341

Matrix: Soil/Solid (dry weight)

QC for Samples:  
1203155002, 1203155006

**Results by SW8260D**

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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**Batch Information**

Analytical Batch: VMS20083  
Analytical Method: SW8260D  
Instrument: VQA 7890/5975 GC/MS  
Analyst: KAJ  
Analytical Date/Time: 7/9/2020 10:14:00AM

Prep Batch: VXX35915  
Prep Method: SW5035A  
Prep Date/Time: 7/9/2020 6:00:00AM  
Prep Initial Wt./Vol.: 50 g  
Prep Extract Vol: 25 mL

Print Date: 07/21/2020 3:35:14PM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [VXX35915]

Blank Spike Lab ID: 1568342

Date Analyzed: 07/09/2020 10:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002, 1203155006

## Results by SW8260D

Parameter	Blank Spike (ug/Kg)			CL
	Spike	Result	Rec (%)	
1,1,1,2-Tetrachloroethane	750	751	100	(78-125)
1,1,1-Trichloroethane	750	814	108	(73-130)
1,1,2,2-Tetrachloroethane	750	757	101	(70-124)
1,1,2-Trichloroethane	750	725	97	(78-121)
1,1-Dichloroethane	750	716	95	(76-125)
1,1-Dichloroethene	750	745	99	(70-131)
1,1-Dichloropropene	750	785	105	(76-125)
1,2,3-Trichlorobenzene	750	738	98	(66-130)
1,2,3-Trichloropropane	750	713	95	(73-125)
1,2,4-Trichlorobenzene	750	779	104	(67-129)
1,2,4-Trimethylbenzene	750	775	103	(75-123)
1,2-Dibromo-3-chloropropane	750	740	99	(61-132)
1,2-Dibromoethane	750	734	98	(78-122)
1,2-Dichlorobenzene	750	753	100	(78-121)
1,2-Dichloroethane	750	726	97	(73-128)
1,2-Dichloropropane	750	829	110	(76-123)
1,3,5-Trimethylbenzene	750	775	103	(73-124)
1,3-Dichlorobenzene	750	769	103	(77-121)
1,3-Dichloropropane	750	728	97	(77-121)
1,4-Dichlorobenzene	750	771	103	(75-120)
2,2-Dichloropropane	750	1070	142	* (67-133)
2-Butanone (MEK)	2250	2380	106	(51-148)
2-Chlorotoluene	750	779	104	(75-122)
2-Hexanone	2250	2320	103	(53-145)
4-Chlorotoluene	750	790	105	(72-124)
4-Isopropyltoluene	750	815	109	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2160	96	(65-135)
Acetone	2250	2110	94	(36-164)
Benzene	750	771	103	(77-121)
Bromobenzene	750	784	105	(78-121)
Bromochloromethane	750	702	94	(78-125)
Bromodichloromethane	750	825	110	(75-127)
Bromoform	750	766	102	(67-132)
Bromomethane	750	785	105	(53-143)

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [VXX35915]

Blank Spike Lab ID: 1568342

Date Analyzed: 07/09/2020 10:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002, 1203155006

## Results by SW8260D

Parameter	Blank Spike (ug/Kg)			CL
	Spike	Result	Rec (%)	
Carbon disulfide	1130	1130	100	(63-132)
Carbon tetrachloride	750	847	113	(70-135)
Chlorobenzene	750	752	100	(79-120)
Chloroethane	750	715	95	(59-139)
Chloroform	750	703	94	(78-123)
Chloromethane	750	775	103	(50-136)
cis-1,2-Dichloroethene	750	729	97	(77-123)
cis-1,3-Dichloropropene	750	838	112	(74-126)
Dibromochloromethane	750	739	99	(74-126)
Dibromomethane	750	748	100	(78-125)
Dichlorodifluoromethane	750	874	116	(29-149)
Ethylbenzene	750	757	101	(76-122)
Freon-113	1130	1260	112	(66-136)
Hexachlorobutadiene	750	914	122	(61-135)
Isopropylbenzene (Cumene)	750	795	106	(68-134)
Methylene chloride	750	837	112	(70-128)
Methyl-t-butyl ether	1130	1200	106	(73-125)
Naphthalene	750	742	99	(62-129)
n-Butylbenzene	750	832	111	(70-128)
n-Propylbenzene	750	808	108	(73-125)
o-Xylene	750	781	104	(77-123)
P & M -Xylene	1500	1540	103	(77-124)
sec-Butylbenzene	750	802	107	(73-126)
Styrene	750	794	106	(76-124)
tert-Butylbenzene	750	781	104	(73-125)
Tetrachloroethene	750	811	108	(73-128)
Toluene	750	683	91	(77-121)
trans-1,2-Dichloroethene	750	775	103	(74-125)
trans-1,3-Dichloropropene	750	801	107	(71-130)
Trichloroethene	750	883	118	(77-123)
Trichlorofluoromethane	750	815	109	(62-140)
Vinyl acetate	750	932	124	(50-151)
Vinyl chloride	750	735	98	(56-135)
Xylenes (total)	2250	2330	103	(78-124)

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## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [VXX35915]  
 Blank Spike Lab ID: 1568342  
 Date Analyzed: 07/09/2020 10:38

Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002, 1203155006

## Results by SW8260D

Parameter	Blank Spike (ug/Kg)			CL
	Spike	Result	Rec (%)	
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	750	100	100	( 71-136 )
4-Bromofluorobenzene (surr)	750	100	100	( 55-151 )
Toluene-d8 (surr)	750	97.2	97	( 85-116 )

## Batch Information

Analytical Batch: **VMS20083**  
 Analytical Method: **SW8260D**  
 Instrument: **VQA 7890/5975 GC/MS**  
 Analyst: **KAJ**

Prep Batch: **VXX35915**  
 Prep Method: **SW5035A**  
 Prep Date/Time: **07/09/2020 06:00**  
 Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL  
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 07/21/2020 3:35:16PM

## Matrix Spike Summary

Original Sample ID: 1203257001  
 MS Sample ID: 1568343 MS  
 MSD Sample ID: 1568344 MSD

Analysis Date: 07/09/2020 14:36  
 Analysis Date: 07/09/2020 11:20  
 Analysis Date: 07/09/2020 11:36  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002, 1203155006

## Results by SW8260D

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	12.8U	793	798	101	793	833	105	78-125	4.40	(< 20)
1,1,1-Trichloroethane	16.0U	793	842	106	793	840	106	73-130	0.27	(< 20)
1,1,2,2-Tetrachloroethane	1.28U	793	782	99	793	792	100	70-124	1.30	(< 20)
1,1,2-Trichloroethane	0.510U	793	772	97	793	800	101	78-121	3.60	(< 20)
1,1-Dichloroethane	16.0U	793	744	94	793	737	93	76-125	0.86	(< 20)
1,1-Dichloroethene	16.0U	793	785	99	793	766	97	70-131	2.50	(< 20)
1,1-Dichloropropene	16.0U	793	811	102	793	814	103	76-125	0.38	(< 20)
1,2,3-Trichlorobenzene	32.0U	793	785	99	793	826	104	66-130	5.10	(< 20)
1,2,3-Trichloropropane	1.28U	793	731	92	793	743	94	73-125	1.50	(< 20)
1,2,4-Trichlorobenzene	16.0U	793	819	103	793	855	108	67-129	4.30	(< 20)
1,2,4-Trimethylbenzene	32.0U	793	803	101	793	835	105	75-123	3.90	(< 20)
1,2-Dibromo-3-chloropropane	64.0U	793	752	95	793	778	98	61-132	3.40	(< 20)
1,2-Dibromoethane	0.640U	793	773	98	793	803	101	78-122	3.80	(< 20)
1,2-Dichlorobenzene	16.0U	793	774	98	793	792	100	78-121	2.30	(< 20)
1,2-Dichloroethane	1.28U	793	756	95	793	743	94	73-128	1.90	(< 20)
1,2-Dichloropropane	6.40U	793	860	108	793	861	108	76-123	0.11	(< 20)
1,3,5-Trimethylbenzene	16.0U	793	785	99	793	822	104	73-124	4.60	(< 20)
1,3-Dichlorobenzene	16.0U	793	798	101	793	809	102	77-121	1.40	(< 20)
1,3-Dichloropropane	6.40U	793	763	96	793	791	100	77-121	3.70	(< 20)
1,4-Dichlorobenzene	16.0U	793	804	101	793	811	102	75-120	0.82	(< 20)
2,2-Dichloropropane	16.0U	793	1135	143 *	793	1123	141 *	67-133	1.30	(< 20)
2-Butanone (MEK)	160U	2380	2447	103	2380	2469	104	51-148	1.10	(< 20)
2-Chlorotoluene	16.0U	793	796	100	793	824	104	75-122	3.40	(< 20)
2-Hexanone	64.0U	2380	2392	101	2380	2469	104	53-145	3.20	(< 20)
4-Chlorotoluene	16.0U	793	801	101	793	822	104	72-124	2.60	(< 20)
4-Isopropyltoluene	64.0U	793	843	106	793	881	111	73-127	4.40	(< 20)
4-Methyl-2-pentanone (MIBK)	160U	2380	2214	93	2380	2247	95	65-135	1.70	(< 20)
Acetone	160U	2380	2147	90	2380	2136	90	36-164	0.83	(< 20)
Benzene	8.00U	793	799	101	793	810	102	77-121	1.50	(< 20)
Bromobenzene	16.0U	793	804	101	793	812	102	78-121	0.94	(< 20)
Bromochloromethane	16.0U	793	731	92	793	715	90	78-125	2.10	(< 20)
Bromodichloromethane	1.28U	793	857	108	793	845	107	75-127	1.30	(< 20)
Bromoform	16.0U	793	806	102	793	829	104	67-132	2.80	(< 20)
Bromomethane	12.8U	793	842	106	793	808	102	53-143	4.20	(< 20)
Carbon disulfide	64.0U	1190	1201	101	1190	1135	95	63-132	5.30	(< 20)
Carbon tetrachloride	8.00U	793	881	111	793	879	111	70-135	0.28	(< 20)
Chlorobenzene	16.0U	793	789	100	793	806	102	79-120	2.10	(< 20)

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### Matrix Spike Summary

Original Sample ID: 1203257001  
 MS Sample ID: 1568343 MS  
 MSD Sample ID: 1568344 MSD

Analysis Date: 07/09/2020 14:36  
 Analysis Date: 07/09/2020 11:20  
 Analysis Date: 07/09/2020 11:36  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002, 1203155006

### Results by SW8260D

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Chloroethane	128U	793	821	104	793	733	92	59-139	11.40	(< 20)
Chloroform	1.01J	793	732	92	793	722	91	78-123	1.30	(< 20)
Chloromethane	16.0U	793	830	105	793	784	99	50-136	5.80	(< 20)
cis-1,2-Dichloroethene	16.0U	793	770	97	793	730	92	77-123	5.30	(< 20)
cis-1,3-Dichloropropene	8.00U	793	879	111	793	878	111	74-126	0.01	(< 20)
Dibromochloromethane	3.20U	793	775	98	793	803	101	74-126	3.50	(< 20)
Dibromomethane	16.0U	793	779	98	793	765	97	78-125	1.70	(< 20)
Dichlorodifluoromethane	32.0U	793	962	121	793	909	115	29-149	5.70	(< 20)
Ethylbenzene	16.0U	793	791	100	793	813	103	76-122	2.90	(< 20)
Freon-113	64.0U	1190	1335	112	1190	1313	110	66-136	1.50	(< 20)
Hexachlorobutadiene	12.8U	793	998	126	793	968	122	61-135	3.10	(< 20)
Isopropylbenzene (Cumene)	16.0U	793	816	103	793	857	108	68-134	4.80	(< 20)
Methylene chloride	64.0U	793	771	97	793	755	95	70-128	2.00	(< 20)
Methyl-t-butyl ether	64.0U	1190	1279	107	1190	1268	107	73-125	0.53	(< 20)
Naphthalene	16.0U	793	780	98	793	816	103	62-129	4.70	(< 20)
n-Butylbenzene	16.0U	793	862	109	793	903	114	70-128	4.60	(< 20)
n-Propylbenzene	16.0U	793	821	104	793	870	110	73-125	5.80	(< 20)
o-Xylene	16.0U	793	813	103	793	835	105	77-123	2.70	(< 20)
P & M -Xylene	32.0U	1591	1602	101	1591	1657	105	77-124	3.50	(< 20)
sec-Butylbenzene	16.0U	793	813	102	793	864	109	73-126	6.20	(< 20)
Styrene	16.0U	793	826	104	793	842	106	76-124	1.90	(< 20)
tert-Butylbenzene	16.0U	793	788	99	793	841	106	73-125	6.60	(< 20)
Tetrachloroethene	8.00U	793	853	108	793	902	114	73-128	5.70	(< 20)
Toluene	16.0U	793	717	90	793	746	94	77-121	4.00	(< 20)
trans-1,2-Dichloroethene	16.0U	793	800	101	793	802	101	74-125	0.20	(< 20)
trans-1,3-Dichloropropene	8.00U	793	839	106	793	878	111	71-130	4.50	(< 20)
Trichloroethene	3.20U	793	903	114	793	922	116	77-123	2.10	(< 20)
Trichlorofluoromethane	32.0U	793	872	110	793	838	106	62-140	4.00	(< 20)
Vinyl acetate	64.0U	793	976	123	793	972	123	50-151	0.42	(< 20)
Vinyl chloride	0.510U	793	786	99	793	753	95	56-135	4.40	(< 20)
Xylenes (total)	48.0U	2380	2414	102	2380	2492	105	78-124	3.20	(< 20)
<b>Surrogates</b>										
1,2-Dichloroethane-D4 (surr)		793	779	98	793	754	95	71-136	3.20	
4-Bromofluorobenzene (surr)		1324	1052	80	1324	1067	81	55-151	1.40	
Toluene-d8 (surr)		793	776	98	793	795	100	85-116	2.40	

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## Matrix Spike Summary

Original Sample ID: 1203257001  
 MS Sample ID: 1568343 MS  
 MSD Sample ID: 1568344 MSD

Analysis Date:  
 Analysis Date: 07/09/2020 11:20  
 Analysis Date: 07/09/2020 11:36  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002, 1203155006

## Results by SW8260D

Parameter	Sample	Matrix Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			

## Batch Information

Analytical Batch: VMS20083  
 Analytical Method: SW8260D  
 Instrument: VQA 7890/5975 GC/MS  
 Analyst: KAJ  
 Analytical Date/Time: 7/9/2020 11:20:00AM

Prep Batch: VXX35915  
 Prep Method: Vol. Extraction SW8260 Field Extracted L  
 Prep Date/Time: 7/9/2020 6:00:00AM  
 Prep Initial Wt./Vol.: 52.59g  
 Prep Extract Vol: 25.00mL

Print Date: 07/21/2020 3:35:17PM

## Method Blank

Blank ID: MB for HBN 1808666 [XXX/43422]  
Blank Lab ID: 1568098

Matrix: Soil/Solid (dry weight)

QC for Samples:  
1203155001, 1203155002, 1203155003, 1203155004, 1203155005

## Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	6.60J	20.0	6.20	mg/Kg
<b>Surrogates</b>				
5a Androstane (surr)	95.3	60-120		%

## Batch Information

Analytical Batch: XFC15656  
Analytical Method: AK102  
Instrument: Agilent 7890B F  
Analyst: CDM  
Analytical Date/Time: 7/16/2020 1:22:00PM

Prep Batch: XXX43422  
Prep Method: SW3550C  
Prep Date/Time: 7/9/2020 10:01:46AM  
Prep Initial Wt./Vol.: 30 g  
Prep Extract Vol: 5 mL

Print Date: 07/21/2020 3:35:18PM



## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [XXX43422]  
 Blank Spike Lab ID: 1568099  
 Date Analyzed: 07/16/2020 13:32

Spike Duplicate ID: LCSD for HBN 1203155  
 [XXX43422]  
 Spike Duplicate Lab ID: 1568100  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155001, 1203155002, 1203155003, 1203155004, 1203155005

## Results by AK102

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	833	663	80	833	665	80	( 75-125 )	0.25	(< 20 )

### Surrogates

5a Androstane (surr)	16.7	102	102	16.7	102	102	( 60-120 )	0.43	
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## Batch Information

Analytical Batch: **XFC15656**  
 Analytical Method: **AK102**  
 Instrument: **Agilent 7890B F**  
 Analyst: **CDM**

Prep Batch: **XXX43422**  
 Prep Method: **SW3550C**  
 Prep Date/Time: **07/09/2020 10:01**  
 Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

## Method Blank

Blank ID: MB for HBN 1808681 [XXX/43423]  
 Blank Lab ID: 1568167

Matrix: Soil/Solid (dry weight)

QC for Samples:  
 1203155002

## Results by 8270D SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
Acenaphthene	12.5U	25.0	6.25	ug/Kg
Acenaphthylene	12.5U	25.0	6.25	ug/Kg
Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/Kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/Kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/Kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/Kg
Chrysene	12.5U	25.0	6.25	ug/Kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/Kg
Fluoranthene	12.5U	25.0	6.25	ug/Kg
Fluorene	12.5U	25.0	6.25	ug/Kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/Kg
Naphthalene	10.0U	20.0	5.00	ug/Kg
Phenanthrene	12.5U	25.0	6.25	ug/Kg
Pyrene	12.5U	25.0	6.25	ug/Kg
<b>Surrogates</b>				
2-Methylnaphthalene-d10 (surr)	85	58-103		%
Fluoranthene-d10 (surr)	83.4	54-113		%

## Batch Information

Analytical Batch: XMS12123  
 Analytical Method: 8270D SIM (PAH)  
 Instrument: SVA Agilent 780/5975 GC/MS  
 Analyst: DSD  
 Analytical Date/Time: 7/10/2020 10:59:00AM

Prep Batch: XXX43423  
 Prep Method: SW3550C  
 Prep Date/Time: 7/9/2020 11:49:55AM  
 Prep Initial Wt./Vol.: 22.5 g  
 Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203155 [XXX43423]

Blank Spike Lab ID: 1568168

Date Analyzed: 07/10/2020 11:20

Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002

## Results by 8270D SIM (PAH)

### Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	114	103	(43-111)
2-Methylnaphthalene	111	117	105	(39-114)
Acenaphthene	111	104	93	(44-111)
Acenaphthylene	111	112	100	(39-116)
Anthracene	111	113	102	(50-114)
Benzo(a)Anthracene	111	95.5	86	(54-122)
Benzo[a]pyrene	111	122	110	(50-125)
Benzo[b]Fluoranthene	111	120	108	(53-128)
Benzo[g,h,i]perylene	111	121	109	(49-127)
Benzo[k]fluoranthene	111	110	99	(56-123)
Chrysene	111	107	96	(57-118)
Dibenzo[a,h]anthracene	111	129	116	(50-129)
Fluoranthene	111	108	97	(55-119)
Fluorene	111	107	96	(47-114)
Indeno[1,2,3-c,d] pyrene	111	136	123	(49-130)
Naphthalene	111	105	95	(38-111)
Phenanthrene	111	108	98	(49-113)
Pyrene	111	103	93	(55-117)

### Surrogates

2-Methylnaphthalene-d10 (surr)	111	89.3	89	(58-103)
Fluoranthene-d10 (surr)	111	84.2	84	(54-113)

## Batch Information

Analytical Batch: XMS12123

Analytical Method: 8270D SIM (PAH)

Instrument: SVA Agilent 780/5975 GC/MS

Analyst: DSD

Prep Batch: XXX43423

Prep Method: SW3550C

Prep Date/Time: 07/09/2020 11:49

Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL

Dupe Init Wt./Vol.: Extract Vol:

## Matrix Spike Summary

Original Sample ID: 1209420003  
 MS Sample ID: 1568169 MS  
 MSD Sample ID: 1568170 MSD

Analysis Date: 07/10/2020 12:41  
 Analysis Date: 07/10/2020 13:02  
 Analysis Date: 07/10/2020 13:22  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1203155002

## Results by 8270D SIM (PAH)

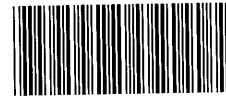
Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	13.4U	119	111	93	119	114	95	43-111	3.00	(< 20)
2-Methylnaphthalene	13.4U	119	114	95	119	117	98	39-114	3.20	(< 20)
Acenaphthene	13.4U	119	103	87	119	105	88	44-111	2.10	(< 20)
Acenaphthylene	13.4U	119	111	93	119	113	95	39-116	2.60	(< 20)
Anthracene	13.4U	119	113	95	119	116	97	50-114	2.70	(< 20)
Benzo(a)Anthracene	13.4U	119	94.3	79	119	97.7	82	54-122	3.60	(< 20)
Benzo(a)pyrene	13.4U	119	119	101	119	124	104	50-125	3.10	(< 20)
Benzo(b)Fluoranthene	13.4U	119	118	99	119	124	104	53-128	5.30	(< 20)
Benzo(g,h,i)perylene	13.4U	119	116	98	119	121	101	49-127	3.20	(< 20)
Benzo(k)fluoranthene	13.4U	119	108	90	119	109	91	56-123	0.89	(< 20)
Chrysene	13.4U	119	104	87	119	108	90	57-118	3.30	(< 20)
Dibenzo(a,h)anthracene	13.4U	119	125	105	119	129	108	50-129	3.10	(< 20)
Fluoranthene	13.4U	119	107	90	119	111	93	55-119	3.90	(< 20)
Fluorene	13.4U	119	107	90	119	110	92	47-114	3.00	(< 20)
Indeno[1,2,3-c,d] pyrene	13.4U	119	132	111	119	137	114	49-130	3.10	(< 20)
Naphthalene	10.8U	119	102	86	119	105	88	38-111	2.50	(< 20)
Phenanthrene	13.4U	119	107	90	119	110	92	49-113	2.50	(< 20)
Pyrene	13.4U	119	103	86	119	106	89	55-117	3.30	(< 20)
<b>Surrogates</b>										
2-Methylnaphthalene-d10 (surr)		119	96.6	81	119	100	84	58-103	3.50	
Fluoranthene-d10 (surr)		119	94.2	79	119	97.5	82	54-113	3.50	

## Batch Information

Analytical Batch: XMS12123  
 Analytical Method: 8270D SIM (PAH)  
 Instrument: SVA Agilent 780/5975 GC/MS  
 Analyst: DSD  
 Analytical Date/Time: 7/10/2020 1:02:00PM

Prep Batch: XXX43423  
 Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml  
 Prep Date/Time: 7/9/2020 11:49:55AM  
 Prep Initial Wt./Vol.: 22.57g  
 Prep Extract Vol: 5.00mL

Print Date: 07/21/2020 3:35:25PM



# CHAIN-OF-CUSTODY RECORD

Laboratory SGS Page 1 of 1  
 Attn: Justin

400 N. 34th Street, Suite 100  
 Seattle, WA 98103  
 (206) 632-8020

2043 Westport Center Drive  
 St. Louis, MO 63146-3564  
 (314) 699-9660

2355 Hill Road  
 Fairbanks, AK 99709  
 (907) 479-0600

5430 Fairbanks Street, Suite 3  
 Anchorage, AK 99518  
 (907) 561-2120

3990 Collins Way, Suite 100  
 Lake Oswego, OR 97035  
 (503) 223-6147

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

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

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

Sample Identity	Lab No.	Time	Date Sampled	Analysis Parameters/Sample Container Description										Total Number of Containers	Remarks/Matrix	
				Comp.	Grab	GR0/BTEX	AK101/EPA 821B	DRO	AK102	VOCs	EPA 8260c	PAH	EPA 8270D SIM			GR0
101293-B4558	(1AB)	10:24	6/30/2020		X	X	X								2	Soil Sample
101293-B4658	(2AB)	14:59	6/30/2020		X		X	X	X	X					2	Soil Sample
101293-B4754	(3AB)	09:01	7/1/2020		X	X	X								2	Soil Sample
101293-B4855	(4AB)	12:30	7/1/2020		X	X	X								2	Soil Sample
101293-B4956	(5AB)	16:02	7/1/2020		X	X	X								2	Soil Sample
101293-STB	(6A)		7/1/2020					X			X			1	Lab trip blank	

Project Information	Sample Receipt
Project Number: <u>101293</u>	Total Number of Containers
Project Name: <u>WES 5021</u>	COC Seals/Intact? Y/N/NA
Contact: <u>SKD</u>	Received Good Cond./Cold
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method:
Sampler: <u>SKD</u>	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: <u>standard</u>
Special Instructions: <u>Profile #365768 GM</u>

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

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: <u>[Signature]</u> Time: <u>4:32 PM</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>Stephanie Dew</u> Date: <u>7/2/2020</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>SHW</u>	Company: _____	Company: _____
Received By: 1.	Received By: 2.	Received By: 3.
Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: <u>[Signature]</u> Time: <u>16:30</u>
Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: <u>Ramey Robinson</u> Date: <u>07/02/20</u>
Company: _____	Company: _____	Company: <u>460C 023 Absent</u>



e-Sample Receipt Form

SGS Workorder #:

1203155



1 2 0 3 1 5 5

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
<b>Chain of Custody / Temperature Requirements</b>	<b>Yes</b>	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
<b>N/A</b> **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 @ 4.6 °C Therm. ID: D23
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
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.		
*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.		
<b>Holding Time / Documentation / Sample Condition Requirements</b>		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)?	Yes	
**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		
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?	Yes	N/A ***Exemption permitted for metals (e.g,200.8/6020A).
<b>Volatile / LL-Hg Requirements</b>		
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)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	
<b>Note to Client:</b> 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>
1203155001-A	No Preservative Required	OK			
1203155001-B	Methanol field pres. 4 C	OK			
1203155002-A	No Preservative Required	OK			
1203155002-B	Methanol field pres. 4 C	OK			
1203155003-A	No Preservative Required	OK			
1203155003-B	Methanol field pres. 4 C	OK			
1203155004-A	No Preservative Required	OK			
1203155004-B	Methanol field pres. 4 C	OK			
1203155005-A	No Preservative Required	OK			
1203155005-B	Methanol field pres. 4 C	OK			
1203155006-A	Methanol field pres. 4 C	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:** Monitoring Well Installation and 2020 Groundwater Monitoring, Williams Express Site  
No. 5021, 6010 Old Seward Highway, Anchorage, Alaska

**Date:** September 2020

**Consultant Firm:** Shannon & Wilson, Inc.

**Laboratory Name:** SGS North America Inc.

**Laboratory Report Number:** 1203155

**Laboratory Report Date:** 7/21/2020

**Contaminated Site Name:** Former Williams Express Store #5021

**ADEC File Number:** 2100.26.030

**Hazard Identification Number:** 24042

(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 to another "network" laboratory or sub-contracted to an alternate laboratory.*

### 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 cooler temperature blank was 4.6° 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:

#### 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:

- *For Method 8260D – LCS recovery for 2,2-dichloropropane does not meet QC criteria. This analyte was not detected in the associated project samples.*
- *For Method 8260D – MS/MSD recoveries for 2,2-dichloropropane do not meet QC criteria. This analyte was not detected in the associated project 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 did not comment on the data quality/usability.*

#### 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:

- d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes** **No** / NA

Comments: *The LOQ for 1,1,2,3-trichloropropane, 1,2-dibromoethane, and dibromochloromethane are greater than its respective ADEC Table C cleanup level.*

- e. Data quality or usability affected?

Comments: *The data cannot be used to determine whether or not concentrations of 1,1,2,3-trichloropropane, 1,2-dibromoethane, and dibromochloromethane are present at concentrations less than the LOQ but greater than the ADEC Method Two cleanup levels.*

## 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: *Although less than the LOQ, estimated (J-flagged) concentrations of the following GRO and DRO were detected in project samples.*

- *GRO (1.28 mg/kg) was detected in the method blank associated with Samples B45S8, B46S8, B47S4, B48S5, B49S6, and STB.*
- *DRO (6.60 mg/kg) was detected in the method blank associated with Samples B45S8, B46S8, B47S4, B48S5, and B49S6.*

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

Comments: *See above*

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

**Yes** / No / NA

Comments: *Project samples with estimated GRO and DRO concentrations less than the LOQ, therefore the results have been flagged "B" and reported as non-detect at the LOQ in the report tables of the Shannon & Wilson report. Samples B48S5, B49S6, and STB did not contain concentrations of GRO greater than the LOQ and Sample B49S6 did not contain concentrations of DRO greater than the LOQ, therefore the method blank detections do not affect the sample and no flag is required.*

- v. Data quality or usability affected?

Comments: *See above.*

**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 LCS recovery for 2,2-dichloropropane (142%) does not meet QC criteria (biased high)*
- 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:
- v. If %R or RPD is outside of acceptable limits, what samples are affected?  
Comments: *All project samples are potentially affected.*
- vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?  
**Yes** / **No** / NA  
Comments: *2,2-dichloropropane was not detected in the associated samples, therefore flagging is not required.*
- vii. Data quality or usability affected?  
Comments: *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:

- 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: *MS/MSD recoveries for 2,2-dichloropropane (143%/141%) do not meet QC criteria (biased high).*

- 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: *All project samples are potentially affected.*

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

**Yes** **No** / NA

Comments: *2,2-dichloropropane was not detected in the parent samples, therefore flagging is not required.*

- vii. Data quality or usability affected?

Comments: *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: *The 4-bromoflorobenzene (GRO surrogate) recovery for Sample B49S6 was 49.8 %.*

- 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: *The Sample B49S6 GRO result is flagged “J-“ to indicate the sample result may be biased low.*

- iv. Data quality or usability affected?

Comments: *See above.*

**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 / NA

Comments:

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

Comments: *Only one cooler was used to transport the samples.*

- 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: *See above.*

**f. Field Duplicate**

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

**Yes** / **No** / NA

Comments: *Per our ADEC-approved workplan a field duplicate was not collected.*

- 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: *See above.*

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

**Yes** / **No** / NA

Comments: *A decontamination or equipment blank was not included in our ADEC-approved work plan.*

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

**Yes** / No / **NA**

Comments:

Laboratory Report Number: 1203155

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 is provided on Page 3 of the SGS Laboratory Report.*



## Laboratory Report of Analysis

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

Report Number: **1203746**

Client Project: **101293 6010 Old Seward Highway**

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: **1203746**  
Project Name/Site: **101293 6010 Old Seward Highway**  
Project Contact: **Dan McMahon**

Refer to sample receipt form for information on sample condition.

**101293-MW42 (1203746001) PS**

8021B - Reported values for ethylbenzene and p&m xylene are above the calibration range. The sample was analyzed past hold at a dilution and results confirm.

**101293-MW46 (1203746003) PS**

AK101 - Surrogate recovery does not meet QC criteria due to matrix interference.

**101293-MW1R (1203746007) PS**

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

**101293-MW10R (1203746008) PS**

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

\*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: 08/17/2020 9:32:00AM



### Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
<b>SW8021B</b>				
1203746001	101293-MW42	VFC15264	o-Xylene	BLC

#### Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

## 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
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>
101293-MW42	1203746001	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW45	1203746002	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW46	1203746003	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW47	1203746004	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW48	1203746005	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW49	1203746006	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW1R	1203746007	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-MW10R	1203746008	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)
101293-WTB	1203746009	07/28/2020	07/29/2020	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water

Print Date: 08/17/2020 9:32:04AM

### Detectable Results Summary

Client Sample ID: **101293-MW42**

Lab Sample ID: 1203746001

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.56	mg/L
Residual Range Organics	0.183J	mg/L

**Volatile Fuels**

Benzene	114	ug/L
Ethylbenzene	281	ug/L
Gasoline Range Organics	2.93	mg/L
o-Xylene	7.40	ug/L
P & M -Xylene	918	ug/L
Toluene	1.19	ug/L
Xylenes (total)	926	ug/L

Client Sample ID: **101293-MW45**

Lab Sample ID: 1203746002

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.212J	mg/L
Residual Range Organics	0.173J	mg/L

**Volatile Fuels**

Benzene	0.240J	ug/L
Ethylbenzene	0.370J	ug/L
o-Xylene	2.28	ug/L
P & M -Xylene	3.25	ug/L
Xylenes (total)	5.53	ug/L

Client Sample ID: **101293-MW46**

Lab Sample ID: 1203746003

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.333J	mg/L
Residual Range Organics	0.215J	mg/L

**Volatile Fuels**

Benzene	239	ug/L
Ethylbenzene	70.5	ug/L
Gasoline Range Organics	1.21	mg/L
o-Xylene	0.950J	ug/L
P & M -Xylene	190	ug/L
Toluene	0.480J	ug/L
Xylenes (total)	191	ug/L

Client Sample ID: **101293-MW47**

Lab Sample ID: 1203746004

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzene	0.190J	ug/L

Client Sample ID: **101293-MW49**

Lab Sample ID: 1203746006

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.276J	mg/L
Residual Range Organics	0.243J	mg/L

### Detectable Results Summary

Client Sample ID: **101293-MW1R**

Lab Sample ID: 1203746007

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.43	mg/L
Residual Range Organics	0.448J	mg/L
Benzene	145	ug/L
Ethylbenzene	507	ug/L
Gasoline Range Organics	25.3	mg/L
o-Xylene	3280	ug/L
P & M -Xylene	4330	ug/L
Toluene	53.4	ug/L
Xylenes (total)	11000	ug/L

Client Sample ID: **101293-MW10R**

Lab Sample ID: 1203746008

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.37	mg/L
Residual Range Organics	0.579	mg/L
Benzene	139	ug/L
Ethylbenzene	494	ug/L
Gasoline Range Organics	25.3	mg/L
o-Xylene	3800	ug/L
P & M -Xylene	5080	ug/L
Toluene	53.1	ug/L
Xylenes (total)	8880	ug/L



Results of 101293-MW42

Client Sample ID: 101293-MW42
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746001
Lab Project ID: 1203746

Collection Date: 07/28/20 14:50
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/07/20 23:10
Container ID: 1203746001-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/07/20 23:10
Container ID: 1203746001-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL



Results of **101293-MW42**

Client Sample ID: **101293-MW42**  
Client Project ID: **101293 6010 Old Seward Highway**  
Lab Sample ID: 1203746001  
Lab Project ID: 1203746

Collection Date: 07/28/20 14:50  
Received Date: 07/29/20 11:39  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.93	0.100	0.0310	mg/L	1		07/31/20 14:11

**Surrogates**

4-Bromofluorobenzene (surr)	114	50-150		%	1		07/31/20 14:11
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**Batch Information**

Analytical Batch: VFC15264  
Analytical Method: AK101  
Analyst: ALJ  
Analytical Date/Time: 07/31/20 14:11  
Container ID: 1203746001-C

Prep Batch: VXX36041  
Prep Method: SW5030B  
Prep Date/Time: 07/31/20 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	114	0.500	0.150	ug/L	1		07/31/20 14:11
Ethylbenzene	281	1.00	0.310	ug/L	1		07/31/20 14:11
o-Xylene	7.40	1.00	0.310	ug/L	1		07/31/20 14:11
P & M -Xylene	918	2.00	0.620	ug/L	1		07/31/20 14:11
Toluene	1.19	1.00	0.310	ug/L	1		07/31/20 14:11
Xylenes (total)	926	3.00	0.930	ug/L	1		07/31/20 14:11

**Surrogates**

1,4-Difluorobenzene (surr)	103	77-115		%	1		07/31/20 14:11
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**Batch Information**

Analytical Batch: VFC15264  
Analytical Method: SW8021B  
Analyst: ALJ  
Analytical Date/Time: 07/31/20 14:11  
Container ID: 1203746001-C

Prep Batch: VXX36041  
Prep Method: SW5030B  
Prep Date/Time: 07/31/20 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 101293-MW45

Client Sample ID: 101293-MW45
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746002
Lab Project ID: 1203746

Collection Date: 07/28/20 15:40
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/07/20 23:20
Container ID: 1203746002-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/07/20 23:20
Container ID: 1203746002-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL





Results of 101293-MW45

Client Sample ID: 101293-MW45
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746002
Lab Project ID: 1203746

Collection Date: 07/28/20 15:40
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0500 U, 0.100, 0.0310, mg/L, 1, 08/03/20 18:19

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 80.2, 50-150, %, 1, 08/03/20 18:19

Batch Information

Analytical Batch: VFC15266
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/03/20 18:19
Container ID: 1203746002-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 87, 77-115, %, 1, 08/03/20 18:19

Batch Information

Analytical Batch: VFC15266
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/03/20 18:19
Container ID: 1203746002-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 101293-MW46

Client Sample ID: 101293-MW46
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746003
Lab Project ID: 1203746

Collection Date: 07/28/20 11:20
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/07/20 23:30
Container ID: 1203746003-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/07/20 23:30
Container ID: 1203746003-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL



Results of 101293-MW46

Client Sample ID: 101293-MW46
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746003
Lab Project ID: 1203746

Collection Date: 07/28/20 11:20
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 1.21, 0.100, 0.0310, mg/L, 1, 08/03/20 18:37

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 162, \*, 50-150, %, 1, 08/03/20 18:37

Batch Information

Analytical Batch: VFC15266
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/03/20 18:37
Container ID: 1203746003-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 105, 77-115, %, 1, 08/03/20 18:37

Batch Information

Analytical Batch: VFC15266
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/03/20 18:37
Container ID: 1203746003-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 101293-MW47

Client Sample ID: 101293-MW47
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746004
Lab Project ID: 1203746

Collection Date: 07/28/20 10:15
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/07/20 23:40
Container ID: 1203746004-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/07/20 23:40
Container ID: 1203746004-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL



Results of 101293-MW47

Client Sample ID: 101293-MW47
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746004
Lab Project ID: 1203746

Collection Date: 07/28/20 10:15
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0500 U, 0.100, 0.0310, mg/L, 1, 08/03/20 18:55

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 77.7, 50-150, %, 1, 08/03/20 18:55

Batch Information

Analytical Batch: VFC15266
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/03/20 18:55
Container ID: 1203746004-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 88, 77-115, %, 1, 08/03/20 18:55

Batch Information

Analytical Batch: VFC15266
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/03/20 18:55
Container ID: 1203746004-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 101293-MW48

Client Sample ID: 101293-MW48
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746005
Lab Project ID: 1203746

Collection Date: 07/28/20 10:05
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/08/20 00:10
Container ID: 1203746005-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/08/20 00:10
Container ID: 1203746005-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL



Results of 101293-MW48

Client Sample ID: 101293-MW48
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746005
Lab Project ID: 1203746

Collection Date: 07/28/20 10:05
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0500 U, 0.100, 0.0310, mg/L, 1, 08/03/20 19:13

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 77.7, 50-150, %, 1, 08/03/20 19:13

Batch Information

Analytical Batch: VFC15266
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/03/20 19:13
Container ID: 1203746005-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 87.2, 77-115, %, 1, 08/03/20 19:13

Batch Information

Analytical Batch: VFC15266
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/03/20 19:13
Container ID: 1203746005-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 101293-MW49

Client Sample ID: 101293-MW49
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746006
Lab Project ID: 1203746

Collection Date: 07/28/20 11:23
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/08/20 00:20
Container ID: 1203746006-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/08/20 00:20
Container ID: 1203746006-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL





Results of 101293-MW49

Client Sample ID: 101293-MW49
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746006
Lab Project ID: 1203746

Collection Date: 07/28/20 11:23
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 0.0500 U, 0.100, 0.0310, mg/L, 1, 08/03/20 19:31

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene (surr), 80.3, 50-150, %, 1, 08/03/20 19:31

Batch Information

Analytical Batch: VFC15266
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 08/03/20 19:31
Container ID: 1203746006-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, Xylenes (total)

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene (surr), 86.6, 77-115, %, 1, 08/03/20 19:31

Batch Information

Analytical Batch: VFC15266
Analytical Method: SW8021B
Analyst: ALJ
Analytical Date/Time: 08/03/20 19:31
Container ID: 1203746006-E

Prep Batch: VXX36043
Prep Method: SW5030B
Prep Date/Time: 08/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 101293-MW1R

Client Sample ID: 101293-MW1R
Client Project ID: 101293 6010 Old Seward Highway
Lab Sample ID: 1203746007
Lab Project ID: 1203746

Collection Date: 07/28/20 14:15
Received Date: 07/29/20 11:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 08/08/20 00:30
Container ID: 1203746007-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15679
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 08/08/20 00:30
Container ID: 1203746007-A
Prep Batch: XXX43539
Prep Method: SW3520C
Prep Date/Time: 07/30/20 16:53
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL



### Results of 101293-MW1R

Client Sample ID: **101293-MW1R**  
 Client Project ID: **101293 6010 Old Seward Highway**  
 Lab Sample ID: 1203746007  
 Lab Project ID: 1203746

Collection Date: 07/28/20 14:15  
 Received Date: 07/29/20 11:39  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

### Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	25.3		1.00	0.310	mg/L	10		07/31/20 19:57

#### Surrogates

4-Bromofluorobenzene (surr)	189	*	50-150		%	10		07/31/20 19:57
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### Batch Information

Analytical Batch: VFC15264  
 Analytical Method: AK101  
 Analyst: ALJ  
 Analytical Date/Time: 07/31/20 19:57  
 Container ID: 1203746007-C

Prep Batch: VXX36041  
 Prep Method: SW5030B  
 Prep Date/Time: 07/31/20 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	145		5.00	1.50	ug/L	10		07/31/20 19:57
Ethylbenzene	507		10.0	3.10	ug/L	10		07/31/20 19:57
o-Xylene	3280		20.0	6.20	ug/L	20		08/03/20 15:54
P & M -Xylene	4330		40.0	12.4	ug/L	20		08/03/20 15:54
Toluene	53.4		10.0	3.10	ug/L	10		07/31/20 19:57
Xylenes (total)	11000		30.0	9.30	ug/L	10		07/31/20 19:57

#### Surrogates

1,4-Difluorobenzene (surr)	111		77-115		%	10		07/31/20 19:57
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### Batch Information

Analytical Batch: VFC15266  
 Analytical Method: SW8021B  
 Analyst: ALJ  
 Analytical Date/Time: 08/03/20 15:54  
 Container ID: 1203746007-E

Prep Batch: VXX36043  
 Prep Method: SW5030B  
 Prep Date/Time: 08/03/20 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Analytical Batch: VFC15264  
 Analytical Method: SW8021B  
 Analyst: ALJ  
 Analytical Date/Time: 07/31/20 19:57  
 Container ID: 1203746007-C

Prep Batch: VXX36041  
 Prep Method: SW5030B  
 Prep Date/Time: 07/31/20 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL



Results of **101293-MW10R**

Client Sample ID: **101293-MW10R**  
Client Project ID: **101293 6010 Old Seward Highway**  
Lab Sample ID: 1203746008  
Lab Project ID: 1203746

Collection Date: 07/28/20 14:35  
Received Date: 07/29/20 11:39  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<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>
Diesel Range Organics	8.37	0.556	0.167	mg/L	1		08/08/20 00:40
<b>Surrogates</b>							
5a Androstane (surr)	93.4	50-150		%	1		08/08/20 00:40

**Batch Information**

Analytical Batch: XFC15679  
Analytical Method: AK102  
Analyst: CDM  
Analytical Date/Time: 08/08/20 00:40  
Container ID: 1203746008-A

Prep Batch: XXX43539  
Prep Method: SW3520C  
Prep Date/Time: 07/30/20 16:53  
Prep Initial Wt./Vol.: 270 mL  
Prep Extract Vol: 1 mL

<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>
Residual Range Organics	0.579	0.463	0.139	mg/L	1		08/08/20 00:40
<b>Surrogates</b>							
n-Triacontane-d62 (surr)	91.8	50-150		%	1		08/08/20 00:40

**Batch Information**

Analytical Batch: XFC15679  
Analytical Method: AK103  
Analyst: CDM  
Analytical Date/Time: 08/08/20 00:40  
Container ID: 1203746008-A

Prep Batch: XXX43539  
Prep Method: SW3520C  
Prep Date/Time: 07/30/20 16:53  
Prep Initial Wt./Vol.: 270 mL  
Prep Extract Vol: 1 mL

## Results of 101293-MW10R

Client Sample ID: **101293-MW10R**  
 Client Project ID: **101293 6010 Old Seward Highway**  
 Lab Sample ID: 1203746008  
 Lab Project ID: 1203746

Collection Date: 07/28/20 14:35  
 Received Date: 07/29/20 11:39  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

## Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	25.3		1.00	0.310	mg/L	10		07/31/20 20:15

### Surrogates

4-Bromofluorobenzene (surr)	189	*	50-150		%	10		07/31/20 20:15
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## Batch Information

Analytical Batch: VFC15264  
 Analytical Method: AK101  
 Analyst: ALJ  
 Analytical Date/Time: 07/31/20 20:15  
 Container ID: 1203746008-C

Prep Batch: VXX36041  
 Prep Method: SW5030B  
 Prep Date/Time: 07/29/20 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	139		5.00	1.50	ug/L	10		07/31/20 20:15
Ethylbenzene	494		10.0	3.10	ug/L	10		07/31/20 20:15
o-Xylene	3800		50.0	15.5	ug/L	50		08/03/20 16:12
P & M -Xylene	5080		100	31.0	ug/L	50		08/03/20 16:12
Toluene	53.1		10.0	3.10	ug/L	10		07/31/20 20:15
Xylenes (total)	8880		150	46.5	ug/L	50		08/03/20 16:12

### Surrogates

1,4-Difluorobenzene (surr)	81.5		77-115		%	50		08/03/20 16:12
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## Batch Information

Analytical Batch: VFC15266  
 Analytical Method: SW8021B  
 Analyst: ALJ  
 Analytical Date/Time: 08/03/20 16:12  
 Container ID: 1203746008-E

Prep Batch: VXX36043  
 Prep Method: SW5030B  
 Prep Date/Time: 08/03/20 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Analytical Batch: VFC15264  
 Analytical Method: SW8021B  
 Analyst: ALJ  
 Analytical Date/Time: 07/31/20 20:15  
 Container ID: 1203746008-C

Prep Batch: VXX36041  
 Prep Method: SW5030B  
 Prep Date/Time: 07/29/20 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL



Results of **101293-WTB**

Client Sample ID: **101293-WTB**  
Client Project ID: **101293 6010 Old Seward Highway**  
Lab Sample ID: 1203746009  
Lab Project ID: 1203746

Collection Date: 07/28/20 08:30  
Received Date: 07/29/20 11:39  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		07/31/20 16:00

**Surrogates**

4-Bromofluorobenzene (surr)	88.4	50-150		%	1		07/31/20 16:00
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**Batch Information**

Analytical Batch: VFC15264  
Analytical Method: AK101  
Analyst: ALJ  
Analytical Date/Time: 07/31/20 16:00  
Container ID: 1203746009-A

Prep Batch: VXX36041  
Prep Method: SW5030B  
Prep Date/Time: 07/31/20 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U	0.500	0.150	ug/L	1		07/31/20 16:00
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		07/31/20 16:00
o-Xylene	0.500 U	1.00	0.310	ug/L	1		07/31/20 16:00
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		07/31/20 16:00
Toluene	0.500 U	1.00	0.310	ug/L	1		07/31/20 16:00
Xylenes (total)	1.50 U	3.00	0.930	ug/L	1		07/31/20 16:00

**Surrogates**

1,4-Difluorobenzene (surr)	93.1	77-115		%	1		07/31/20 16:00
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**Batch Information**

Analytical Batch: VFC15264  
Analytical Method: SW8021B  
Analyst: ALJ  
Analytical Date/Time: 07/31/20 16:00  
Container ID: 1203746009-A

Prep Batch: VXX36041  
Prep Method: SW5030B  
Prep Date/Time: 07/31/20 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Method Blank

Blank ID: MB for HBN 1809791 [VXX/36041]  
Blank Lab ID: 1572564

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1203746001, 1203746007, 1203746008, 1203746009

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	88.3	50-150		%

### Batch Information

Analytical Batch: VFC15264  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: ALJ  
Analytical Date/Time: 7/31/2020 11:37:00AM

Prep Batch: VXX36041  
Prep Method: SW5030B  
Prep Date/Time: 7/31/2020 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 08/17/2020 9:32:09AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203746 [VXX36041]  
 Blank Spike Lab ID: 1572567  
 Date Analyzed: 07/31/2020 12:30

Spike Duplicate ID: LCSD for HBN 1203746 [VXX36041]  
 Spike Duplicate Lab ID: 1572568  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1203746001, 1203746007, 1203746008, 1203746009

## Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.20	120	1.00	1.18	118	( 60-120 )	2.20	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500	96	96	0.0500	95.9	96	( 50-150 )	0.10	

## Batch Information

Analytical Batch: **VFC15264**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **ALJ**

Prep Batch: **VXX36041**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/31/2020 06:00**  
 Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL





### Method Blank

Blank ID: MB for HBN 1809791 [VXX/36041]  
Blank Lab ID: 1572564

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1203746001, 1203746007, 1203746008, 1203746009

### Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	93.9	77-115		%

### Batch Information

Analytical Batch: VFC15264  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: ALJ  
Analytical Date/Time: 7/31/2020 11:37:00AM

Prep Batch: VXX36041  
Prep Method: SW5030B  
Prep Date/Time: 7/31/2020 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 08/17/2020 9:32:13AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203746 [VXX36041]  
 Blank Spike Lab ID: 1572565  
 Date Analyzed: 07/31/2020 12:12

Spike Duplicate ID: LCSD for HBN 1203746 [VXX36041]  
 Spike Duplicate Lab ID: 1572566  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1203746001, 1203746007, 1203746008, 1203746009

## Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	109	109	100	112	112	( 80-120 )	2.50	(< 20 )
Ethylbenzene	100	105	105	100	106	106	( 75-125 )	0.92	(< 20 )
o-Xylene	100	98.0	98	100	99.6	100	( 80-120 )	1.70	(< 20 )
P & M -Xylene	200	203	101	200	204	102	( 75-130 )	0.81	(< 20 )
Toluene	100	114	114	100	113	113	( 75-120 )	0.53	(< 20 )
Xylenes (total)	300	301	100	300	304	101	( 79-121 )	1.10	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene (surr)	50	98.8	99	50	101	101	( 77-115 )	2.30	

## Batch Information

Analytical Batch: **VFC15264**  
 Analytical Method: **SW8021B**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **ALJ**

Prep Batch: **VXX36041**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **07/31/2020 06:00**  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

## Method Blank

Blank ID: MB for HBN 1809798 [VXX/36043]  
Blank Lab ID: 1572613

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	80.9	50-150		%

## Batch Information

Analytical Batch: VFC15266  
Analytical Method: AK101  
Instrument: Agilent 7890 PID/FID  
Analyst: ALJ  
Analytical Date/Time: 8/3/2020 11:48:00AM

Prep Batch: VXX36043  
Prep Method: SW5030B  
Prep Date/Time: 8/3/2020 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 08/17/2020 9:32:18AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203746 [VXX36043]  
 Blank Spike Lab ID: 1572616  
 Date Analyzed: 08/03/2020 12:42

Spike Duplicate ID: LCSD for HBN 1203746 [VXX36043]  
 Spike Duplicate Lab ID: 1572617  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.958	96	1.00	0.925	93	( 60-120 )	3.40	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500	86.5	87	0.0500	80.6	81	( 50-150 )	7.10	

## Batch Information

Analytical Batch: **VFC15266**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890 PID/FID**  
 Analyst: **ALJ**

Prep Batch: **VXX36043**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/03/2020 06:00**  
 Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL



### Method Blank

Blank ID: MB for HBN 1809798 [VXX/36043]  
Blank Lab ID: 1572613

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

### Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
<b>Surrogates</b>				
1,4-Difluorobenzene (surr)	86.5	77-115		%

### Batch Information

Analytical Batch: VFC15266  
Analytical Method: SW8021B  
Instrument: Agilent 7890 PID/FID  
Analyst: ALJ  
Analytical Date/Time: 8/3/2020 11:48:00AM

Prep Batch: VXX36043  
Prep Method: SW5030B  
Prep Date/Time: 8/3/2020 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 08/17/2020 9:32:22AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203746 [VXX36043]  
 Blank Spike Lab ID: 1572614  
 Date Analyzed: 08/03/2020 12:24

Spike Duplicate ID: LCSD for HBN 1203746 [VXX36043]  
 Spike Duplicate Lab ID: 1572615  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	116	116	100	112	112	( 80-120 )	3.60	(< 20 )
Ethylbenzene	100	114	114	100	109	109	( 75-125 )	4.50	(< 20 )
o-Xylene	100	112	112	100	106	106	( 80-120 )	5.20	(< 20 )
P & M -Xylene	200	227	113	200	215	108	( 75-130 )	5.10	(< 20 )
Toluene	100	118	118	100	113	113	( 75-120 )	4.20	(< 20 )
Xylenes (total)	300	338	113	300	321	107	( 79-121 )	5.10	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene (surr)	50	103	103	50	101	101	( 77-115 )	1.70	

## Batch Information

Analytical Batch: **VFC15266**  
 Analytical Method: **SW8021B**  
 Instrument: **Agilent 7890 PID/FID**  
 Analyst: **ALJ**

Prep Batch: **VXX36043**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/03/2020 06:00**  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

## Method Blank

Blank ID: MB for HBN 1809591 [XXX/43539]  
 Blank Lab ID: 1571753

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1203746001, 1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
<b>Surrogates</b>				
5a Androstane (surr)	90.9	60-120		%

## Batch Information

Analytical Batch: XFC15679  
 Analytical Method: AK102  
 Instrument: Agilent 7890B R  
 Analyst: CDM  
 Analytical Date/Time: 8/7/2020 8:29:00PM

Prep Batch: XXX43539  
 Prep Method: SW3520C  
 Prep Date/Time: 7/30/2020 4:53:47PM  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Print Date: 08/17/2020 9:32:27AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203746 [XXX43539]  
 Blank Spike Lab ID: 1571754  
 Date Analyzed: 08/07/2020 20:40

Spike Duplicate ID: LCSD for HBN 1203746 [XXX43539]  
 Spike Duplicate Lab ID: 1571755  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1203746001, 1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	18.3	92	20	18.8	94	( 75-125 )	2.20	(< 20 )
<b>Surrogates</b>									
5a Androstane (surr)	0.4	104	104	0.4	107	107	( 60-120 )	3.10	

## Batch Information

Analytical Batch: **XFC15679**  
 Analytical Method: **AK102**  
 Instrument: **Agilent 7890B R**  
 Analyst: **CDM**

Prep Batch: **XXX43539**  
 Prep Method: **SW3520C**  
 Prep Date/Time: **07/30/2020 16:53**  
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL



## Method Blank

Blank ID: MB for HBN 1809591 [XXX/43539]  
Blank Lab ID: 1571753

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1203746001, 1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.250U	0.500	0.150	mg/L
<b>Surrogates</b>				
n-Triacontane-d62 (surr)	87.9	60-120		%

## Batch Information

Analytical Batch: XFC15679  
Analytical Method: AK103  
Instrument: Agilent 7890B R  
Analyst: CDM  
Analytical Date/Time: 8/7/2020 8:29:00PM

Prep Batch: XXX43539  
Prep Method: SW3520C  
Prep Date/Time: 7/30/2020 4:53:47PM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 08/17/2020 9:32:31AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1203746 [XXX43539]  
 Blank Spike Lab ID: 1571754  
 Date Analyzed: 08/07/2020 20:40

Spike Duplicate ID: LCSD for HBN 1203746 [XXX43539]  
 Spike Duplicate Lab ID: 1571755  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1203746001, 1203746002, 1203746003, 1203746004, 1203746005, 1203746006, 1203746007, 1203746008

## Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	20	17.9	89	20	18.1	90	( 60-120 )	0.95	(< 20 )
<b>Surrogates</b>									
n-Triacontane-d62 (surr)	0.4	88.7	89	0.4	91.5	92	( 60-120 )	3.00	

## Batch Information

Analytical Batch: **XFC15679**  
 Analytical Method: **AK103**  
 Instrument: **Agilent 7890B R**  
 Analyst: **CDM**

Prep Batch: **XXX43539**  
 Prep Method: **SW3520C**  
 Prep Date/Time: **07/30/2020 16:53**  
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Shannon & Wilson, Inc.  
 5430 Fairbanks Street, Suite 3  
 Anchorage, Alaska 99518  
 (907) 561-2120  
 Fax (206) 695-6777

SGS North America Inc.

GRO- AK101

BTEX- EPA Method 8021B

DRO/RRO- AK102/ AK103

1203746



Date	Time	Sample ID	Total Containers							
7/28/2020	14:50	1AE 101293-MW42	5	X	X	X				
7/28/2020	15:40	2AE 101293-MW45	5	X	X	X				
7/28/2020	11:20	3AE 101293-MW46	5	X	X	X				
7/28/2020	10:15	4AE 101293-MW47	5	X	X	X				
7/28/2020	10:05	5AE 101293-MW48	5	X	X	X				
7/28/2020	11:23	6AE 101293-MW49	5	X	X	X				
7/28/2020	14:15	7AE 101293-MW1R	5	X	X	X				
7/28/2020	14:35	8AE 101293-MW10R	5	X	X	X				
7/28/2020	8:30	9AC 101293-WTB	1 Box	X	X					

<b>Relinquished By:</b>		<b>Relinquished By:</b>		<b>Project Information</b>	
Signature: <i>[Signature]</i>		Signature: <i>[Signature]</i>		Project Number: 101293	
Print Name: Alec Rizzo		Print Name: <i>[Signature]</i>		Project Name: 6010 Old Seward Highway # 365300 210	
Company: Shannon & Wilson, Inc.		Company: <i>[Signature]</i>		Contact: Dan McMahon/ Alec Rizzo	
Date: 7/29/20		Date: <i>[Signature]</i>		Sampler: AJR	
Time: 1135		Time: <i>[Signature]</i>		Special Instructions:	
<b>Received By:</b>		<b>Received By:</b>		<b>Sample Receipt</b>	
Signature: <i>[Signature]</i>		Signature: <i>[Signature]</i>		Shipped Via: Hand Delivered	
Print Name: <i>[Signature]</i>		Print Name: Michelle Albarran		Cooler Temperature Upon Arrival: 3.1 DSF	
Company: <i>[Signature]</i>		Company: SGS		Sample Matrix: Water	
Date: <i>[Signature]</i>		Date: 7-29-20		10 Working DAY TAT, Terrabase TF3 File Format	
Time: <i>[Signature]</i>		Time: 1139			



e-Sample Receipt Form

SGS Workorder #:

1203746



1 2 0 3 7 4 6

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
<b>Chain of Custody / Temperature Requirements</b>	<b>Yes</b>	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
<b>N/A</b> **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 @ 3.1 °C Therm. ID: D57
		Cooler ID: @ °C Therm. ID:
		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.		
<b>Holding Time / Documentation / Sample Condition Requirements</b>		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)?	Yes	
**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		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
		***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
<b>Volatile / LL-Hg Requirements</b>		
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	
<b>Note to Client:</b> 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>
1203746001-A	No Preservative Required	OK			
1203746001-B	No Preservative Required	OK			
1203746001-C	HCL to pH < 2	OK			
1203746001-D	HCL to pH < 2	OK			
1203746001-E	HCL to pH < 2	OK			
1203746002-A	No Preservative Required	OK			
1203746002-B	No Preservative Required	OK			
1203746002-C	HCL to pH < 2	OK			
1203746002-D	HCL to pH < 2	OK			
1203746002-E	HCL to pH < 2	OK			
1203746003-A	No Preservative Required	OK			
1203746003-B	No Preservative Required	OK			
1203746003-C	HCL to pH < 2	OK			
1203746003-D	HCL to pH < 2	OK			
1203746003-E	HCL to pH < 2	OK			
1203746004-A	No Preservative Required	OK			
1203746004-B	No Preservative Required	OK			
1203746004-C	HCL to pH < 2	OK			
1203746004-D	HCL to pH < 2	OK			
1203746004-E	HCL to pH < 2	OK			
1203746005-A	No Preservative Required	OK			
1203746005-B	No Preservative Required	OK			
1203746005-C	HCL to pH < 2	OK			
1203746005-D	HCL to pH < 2	OK			
1203746005-E	HCL to pH < 2	OK			
1203746006-A	No Preservative Required	OK			
1203746006-B	No Preservative Required	OK			
1203746006-C	HCL to pH < 2	OK			
1203746006-D	HCL to pH < 2	OK			
1203746006-E	HCL to pH < 2	OK			
1203746007-A	No Preservative Required	OK			
1203746007-B	No Preservative Required	OK			
1203746007-C	HCL to pH < 2	OK			
1203746007-D	HCL to pH < 2	OK			
1203746007-E	HCL to pH < 2	OK			
1203746008-A	No Preservative Required	OK			
1203746008-B	No Preservative Required	OK			
1203746008-C	HCL to pH < 2	OK			
1203746008-D	HCL to pH < 2	OK			
1203746008-E	HCL to pH < 2	OK			
1203746009-A	HCL to pH < 2	OK			
1203746009-B	HCL to pH < 2	OK			
1203746009-C	HCL to pH < 2	OK			

Container Id

Preservative

Container  
Condition

Container Id

Preservative

Container  
Condition

#### 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 that 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:** Monitoring Well Installation and 2020 Groundwater Monitoring, Williams Express Site  
No. 5021, 6010 Old Seward Highway, Anchorage, Alaska

**Date:** September 2020

**Consultant Firm:** Shannon & Wilson, Inc.

**Laboratory Name:** SGS North America Inc.

**Laboratory Report Number:** 1203746

**Laboratory Report Date:** 8/17/2020

**Contaminated Site Name:** Former Williams Express Store #5021

**ADEC File Number:** 2100.26.030

**Hazard Identification Number:** 24042

(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 to another "network" laboratory or sub-contracted to an alternate laboratory.*

### 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 cooler temperature blank was 3.1° 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: *See above.*

#### 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:

- *For Method 8021B – In Sample MW42, the reported value for ethylbenzene and p&m xylene were above calibration range. The sample was analyzed past hold time at a dilution and confirm the results.*
- *For Method AK101 – In Sample MW46, the surrogate recovery does not meet QC criteria due to matrix interference.*
- *For Method AK101 – In Samples MW1R and MW10R, surrogate recovery for 4-bromofluorobenzene did not meet QC criteria due to matrix interference.*

- 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: *See above.*

#### 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 collected as part of this data package.
- 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: *NA*
- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?  
**Yes / No / NA**  
Comments:
- 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:

- 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:

- 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:

**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:

- 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:

**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:

*AK 101 - Surrogate 4-Bromofluorobenzene recovery (biased high) did not meet QC criteria in Samples MW46, MW1R, and MW10R.*

- 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: *GRO results for Samples MW46, MW1R, and MW10R are considered biased high and flagged “J+” in Table 5 of this report.*

- iv. Data quality or usability affected?

Comments: *See above.*

**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 / NA

Comments:

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

Comments: *Only one cooler was used to transport the samples.*

- 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: *See above.*

**f. Field Duplicate**

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

Yes  No / NA

Comments: *Sample MW10R is a duplicate of Sample MW1R.*

- 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: *See above.*

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

Yes  No / NA

Comments: *A decontamination or equipment blank was not included in our ADEC-approved work plan.*

- 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 is provided on Page 4 of the SGS Laboratory Report.*

**APPENDIX F**

**IMPORTANT INFORMATION ABOUT YOUR  
GEOTECHNICAL/ENVIRONMENTAL REPORT**



Date: September 2020  
To: Williams

## **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 which 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