Additional Release Investigation
Warning Lites of Alaska
591 West 67th Avenue
Anchorage, Alaska
ADEC File 2100.26.580

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Submitted To:
Warning Lites of Alaska
591 West 67th Avenue
Anchorage, Alaska 99518

By:

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
Phone: (907)561-2120
Fax: (907)561-4483

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska Method
bgs	Below ground surface
btoc	Below top of casing
Discovery	Discovery Drilling, Inc.
DQO	Data quality objective
DRO	Diesel range organics
EPA	Environmental Protection Agency
IDW	Investigation Derived Waste
L/min	Liters per minute
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate
LDRC	Laboratory Data Review Checklist
LOQ	Limit of quantitation
mg/kg	Milligrams per kilogram
MS/MSD	Matrix spike/matrix spike duplicate
MTBE	Methyl-t-Butyl Ether
mV	Millivolts
NTU	Nephelometric Turbidity Units
ORP	Oxidation Reduction Potential
PAHs	Polynuclear Aromatic Hydrocarbons
PID	Photoionization detector
PVC	Polyvinyl chloride
ppm	Parts per million
RPD	Relative percent difference
SGS	SGS North America Inc.
VOCs	Volatile Organic Compounds
UST	Underground storage tank

ADDITIONAL RELEASE INVESTIGATION
WARNING LITES OF ALASKA
591 WEST 67TH AVENUE
ANCHORAGE, ALASKA

1.0 INTRODUCTION

This report presents the results of Shannon & Wilson's additional release investigation activities conducted at 591 West 67th Avenue, Anchorage, Alaska. During an underground storage tank (UST) closure assessment conducted in May 2013, benzene-impacted soil was documented at the limits of the UST excavation.

The additional release investigation and groundwater sampling project was performed in accordance with our June 8, 2017 work plan, which was approved by Mr. Robert Weimer of the Alaska Department of Environmental Conservation (ADEC) on July 14, 2017 via email.

2.0 BACKGROUND

In May 2013, benzene-impacted soil was encountered during the removal of a 4,000-gallon dual-compartment UST used to dispense gasoline and diesel fuel. The tank was located on the southwest portion of the property, as shown on Figure 1. A release investigation was conducted in January 2014 to evaluate the extent of soil contamination and determine if groundwater has been impacted, as documented in our June 2014 *Release Investigation, Warning Lites of Alaska, 591 West 67th Avenue, Anchorage, Alaska* report. Four borings (Boring B1 through B4) and three monitoring wells (B1MW through B3MW) were advanced/installed in the vicinity of the former tank. Diesel range organics (DRO) (839 milligrams per kilogram [mg/kg]) exceeding the ADEC Method Two migration to groundwater cleanup level of 250 mg/kg was identified in a soil sample collected from Boring B1, located north of the former tank. Benzene (14.4 micrograms per liter [µg/L]) exceeding the ADEC Table C cleanup level of 4.6 µg/L was detected in a groundwater sample collected from B2MW, located south of the former tank.

In a letter dated December 15, 2014, Mr. Robert Weimer of the ADEC requested quarterly groundwater sampling of the site's three groundwater monitoring wells and further delineation of DRO soil contamination north of the former tank location. Four quarterly groundwater sampling events were conducted in 2015 and 2016. During each quarterly event, benzene was measured in the groundwater samples collected from Well B2MW at concentrations greater than the applicable ADEC Table C cleanup level. All other detected analytes were either not detected or measured at concentrations less than the applicable ADEC Table C cleanup levels. Groundwater flow direction was measured generally to the south-southwest.

The sampling program was reduced to quarterly groundwater sampling of Well B2MW and semi-annual sampling of Wells B1MW and B3MW, based on a December 6, 2015 letter from the ADEC. It was also requested that additional soil borings and monitoring wells be installed to define the nature and extent of the soil contamination at the site.

The project purpose is to progress towards a cleanup complete designation with or without institutional controls from the ADEC. The objectives of this project are to comply with ADEC's requests outlined in a December 6, 2016 letter from the ADEC. The project site and boring and monitoring well locations are shown on Figure 1.

3.0 FIELD ACTIVITIES

Field work for this project consisted of advancing and sampling four soil borings (B5 through B8); installing and developing two groundwater monitoring wells (Monitoring Wells B5MW and B6MW), collecting analytical soil and groundwater samples, investigation derived waste (IDW) disposal, and conducting a level-loop survey. Discovery Drilling Inc. (Discovery) of Anchorage, Alaska provided the equipment and personnel to perform the well installation. SGS North America Inc. (SGS) provided analysis of soil and groundwater samples. Photographs taken during the field activities are included in Appendix A. Field notes are included in Appendix B. Boring logs and well construction logs are included in Appendix C.

3.1 Soil Borings

Four soil borings, designated Borings B5 through B8, were advanced by Discovery on January 4, 2018. Prior to advancing the borings, the utility locate center was contacted to mark buried utilities within the project area. The locations of Borings B5 (Photo 1) and B6 were selected downgradient of the former UST excavation, with respect to groundwater flow direction, to evaluate the extent of benzene contamination previously identified in groundwater samples collected from Well B2MW. The placement of Borings B7 and B8 were selected to evaluate the extent of DRO contamination previously identified in Boring B1. The borings were advanced by Discovery using a GeoProbe® drill rig. The borings ranged in depth from 12.2 feet below ground surface (bgs) in Boring B6 to 15 feet bgs in Boring B7. A representative of Shannon & Wilson was present during field activities to log the materials encountered during drilling and sample the subsurface soil.

3.2 Soil Screening and Sampling

Soil samples were recovered on a continuous basis using 5-foot sampling sleeves. Each 5-foot section of plastic sleeve was removed from the sampling device and split down the long axis. The soil section was then visually subdivided into 2.5-foot intervals for field screening purposes,

approximately half of the sample recovery length. Soil screening samples were collected at about 2.5-foot intervals beginning 0.5 feet to the base of each boring. Soil samples were screened for volatile vapors using an ADEC-approved headspace sampling technique and a Thermo Instruments OVM 580B photoionization detector (PID). 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, warmed to a common temperature, and screened within 60 minutes of collection.

One analytical soil sample was collected from each of Borings B5, B6, and B8, and two samples were collected from Boring B7. A definitive groundwater contact was not encountered in Borings B5 and B6 during drilling; therefore, samples were collected at depths based on nearby groundwater depth measurements, between approximately 5 and 9.5 feet bgs. Samples were collected from the groundwater/soil interface in Borings B7 and B8, approximately 10 feet bgs.

The analytical soil samples were collected using methanol preservation for volatile analysis. In accordance with the method, at least 25 grams of soil were quickly placed into a laboratory supplied 4-ounce jar that had been pre-weighed. Afterward, 25 milliliters of reagent grade methanol were added to submerge the soil. The methanol extracts the hydrocarbons from the soil at the time of sampling, thereby reducing the possible loss of volatile constituents prior to sample analysis. For each soil sample submitted for non-volatile analysis, the laboratory-supplied jar was completely filled with soil taking care to remove gravel and debris, if present. The sample was transferred to the appropriate laboratory-supplied jar using decontaminated stainless-steel spoons, and transferred to the laboratory in a cooler with ice packs using chain-of-custody procedures. Table 1 presents a description of the soil sample locations, depths, and headspace results.

3.3 Monitoring Well Installation

Borings B5 and B6 were completed as Monitoring Wells B5MW (Photo 2) and B6MW, respectively. The monitoring wells were constructed of 2-inch nominal inside diameter schedule 40 polyvinyl chloride (PVC) pipe with threaded connections. The lower sections of the wells were constructed of 10-foot sections of PVC well screen with 0.010-inch slots. A continuous #10 to #20 silica sand pack was used to backfill around the well screens to about 0.5 foot above the screened section. Bentonite chips were used to backfill above the filter pack to about 0.5-foot bgs. Gravel was placed above the bentonite. The monitoring wells were completed with flush mount protective casings embedded in asphalt to match the surrounding grade. Monitoring well construction details are included in Appendix C.

3.4 Monitoring Well Development and Sampling

Shannon & Wilson attempted to develop Monitoring Wells B5MW and B6MW and sample Wells B1MW, B2MW, and B3MW on January 11, 2018; however, groundwater recharge was too slow for effective development. Well B2MW was the only well with sufficient groundwater to be sampled. The ADEC was notified, and well development and the remaining sampling activities were postponed until the Spring 2018 when it was expected that groundwater levels would be higher.

On May 21, 2018, prior to initiating the well development activities, water depth relative to the top of the well casings was measured with an electronic water level indicator in Wells B1MW, B2MW, B3MW, B5MW and B6MW. Groundwater levels ranged from 2.63 feet below top of casing (btoc) in Well B5MW to 4.34 feet btoc in Well B1MW.

Wells B5MW and B6MW were developed using a surge block and a submersible pump with dedicated disposable tubing. Three to five-minute periods of surging were alternated with periods of pumping. During well development, water quality parameters, including pH, specific conductance, temperature, and turbidity were measured with Hanna and Hach water quality instruments. Wells B5MW and Well B6 was purged dry three and two times, respectively, during development. Approximately 29.5 and 9.25 gallons were removed from Monitoring Wells B5MW and B6MW, respectively.

Monitoring Wells B1MW, B2MW, and B3MW were purged and sampled using low-flow techniques to reduce the effects of stagnant well casing water on chemical concentrations and to obtain a groundwater sample that is representative of the surrounding water-bearing formation. The well was purged and sampled with a submersible pump and disposable tubing. The pump inlet was set at within 1 foot of the surface of the groundwater column. The pump level was adjusted as necessary to maintain pump rate of about 0.1 liters per minute (L/min) with a goal of limiting the sustained water drawdown to a maximum drawdown was 0.3 feet (~4 inches). However, water drawdown could not be sustained. During the purging process, field personnel monitored water quality parameters (pH, temperature, turbidity, oxidation reduction potential [ORP], and conductivity), purge volume, and drawdown which were recorded at 5-minute intervals.

Stabilization criteria is composed three successive readings of: pH is within 0.1-unit, temperature is within 3 percent (minimum 0.2 degree Celsius), conductivity is within 3 percent, ORP is within 10 millivolts (mV), and turbidity is within 10 percent or three consecutive readings of less than 10 nephelometric turbidity units (NTUs). Due to insufficient groundwater, the drawdown and water quality parameters did not stabilize during the development of Wells B5MW and B6MW or the purging of Wells B1Mw through B3MW. Per our ADEC approved

workplan, if water quality parameters did not stabilize after three hours of effort during development or within one hour of purging, stabilization of water quality parameters are not required. Therefore, with the exception of Sample B1MW, groundwater samples were collected after three hours of effort was expanded during development or after 1 well volume was removed during purging, and all wells had recovered to at least 80 percent of the pre-purge volume. The final water quality parameters are listed on Tables 2.1 and 2.2.

3.5 Investigation Derived Waste

IDW from this project consisted of four 55-gallon drums of drill cuttings and two 55-gallon drums of purge and development water. The ADEC was contacted on August 7, 2018 regarding IDW disposal and has not responded at the time of this report. Following disposal and/or landspreading of the drill cuttings and/or purge water, disposal receipts will be provided under separate cover.

3.6 Well Survey

Shannon & Wilson personnel conducted a level loop survey on June 8, 2018 to determine the top-of-casing elevations of the groundwater monitoring wells relative to a temporary benchmark with an elevation designated 100.00 feet. The elevations were surveyed to an accuracy of 0.01 foot. Depths to water measurements from each on-site well were recorded on May 21, 2018 to determine groundwater flow direction (see Section 3.4). The surveyed well elevations and corresponding May 2018 groundwater elevations are listed in Table 2.2. In addition, the horizontal positions of the wells were recorded using swing tie measurements to permanent site features.

4.0 LABORATORY ANALYSES

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

The six analytical soil samples, including one duplicate, were analyzed for DRO by Alaska Method (AK) 102 and volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method 8260C. Per the ADEC approved June 2017 work plan, two samples (one from Boring B6 and one from Boring B8) were also analyzed for polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM. The analytical soil sample results are summarized in Table 3.

The eight groundwater samples, including two duplicates, were analyzed for DRO by AK 102 and VOCs by EPA Method 8260B. Trip blanks accompanied the samples and were analyzed for VOCs by EPA Method 8260B. The analytical groundwater sample results are summarized in Table 4.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions observed during the drilling and monitoring well development and sampling are discussed below and provided in the borings logs included as Appendix C.

5.1 Soil

Soil encountered in Borings B5 through B8 generally consisted of coarse-grained material (sand with gravel or sand with silt and gravel) to approximately 3 to 5 feet bgs. In Borings B6 through B8, this coarse-grained material is underlain by 4.5 to 9-foot layers of peat. About 4 to 5 feet of silt was observed below the peat in Borings B6 and B7.

5.2 Groundwater

During drilling, a definitive groundwater contact was not encountered in Borings B5 and B6, although potential water-bearing zones were documented between approximately 3 and 9.5 feet bgs within peat with higher moisture contents. Groundwater was observed at approximately 10 feet bgs in Borings B7 and B8. Following monitoring well installation on January 11, 2018, groundwater was measured as 7.01 feet btoc in Well B5MW and 7.03 feet btoc in Well B6MW feet bgs. Prior to initiating well development and sampling activities on May 21, 2018, groundwater was measured between 2.63 (B5MW) and 4.34 (B1MW) feet btoc. Surveyed groundwater elevations ranged from 93.83 feet in Monitoring Well B2MW to 94.47 feet in Well B3MW in May 2018.

The static water level elevations measured at the site are 7 to 8 feet above the observed groundwater when observed during drilling activities. Subsurface conditions in Borings B6 through B8 appeared similar to Borings B1 through B3. However, underlying peat layers were not observed in Boring B5, which is located within the West 67th Avenue right-of-way. This also leads to uncertainty with regard to localized groundwater flow direction. Based on our field observations it appears that groundwater is influenced by the amount of water seasonally present within the peat underlying the site, and therefore fluctuations in groundwater depth and flow direction. Based on groundwater measurements from the on-site monitoring wells, the groundwater flow in May 2018 is generally to the west/northwest. Previous data shows that in

May 2014, August 2015, and May 2016 groundwater flow was to the west/southwest; October 2015, February 2016, and January 2018 groundwater flow was to the southwest. A rose-diagram showing historical groundwater flow direction is shown on Figure 2.2.

6.0 DISCUSSION OF ANALYTICAL RESULTS

The analytical soil and groundwater results were compared to ADEC cleanup levels presented in the November 2017, 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.

6.1 Soil Sample Analytical Results

DRO was detected at a concentration of 534 mg/kg in Boring B7 at 7.5-10 feet bgs, which is greater than the ADEC cleanup level of 250 mg/kg. This sample was collected at the soil/water interface within a layer of peat. According to the laboratory, the moisture content and the absence of alkane peaks in the chromatogram associated with the sample are both indicative of biogenic origins (naturally occurring organics) and not petroleum hydrocarbons. The remaining soil samples collected from Borings B7 and Sample B8 did not contain DRO at concentrations greater than the ADEC cleanup level. The sample from Boring B6 collected at 7.5-10 feet bgs contained concentrations of methyl-t-butyl ether (MTBE), 1-methylnaphthalene, and phenanthrene at concentrations less than the applicable ADEC Method Two cleanup levels. VOCs and PAHs were not detected in the soil samples; however, the benzene detection limit was elevated above the ADEC cleanup level in Sample B7S4.

6.2 Groundwater Sample Analytical Results

The January 2018 duplicate Sample set B2MW/B4MW contained a maximum benzene concentration of 51.7 µg/L, which is greater than the ADEC cleanup level of 4.6 µg/L. Cis-1,2-dichloroethene and MTBE were also detected in the duplicate sample set B2MW/B4MW, but at concentrations less than the ADEC cleanup levels. An estimated DRO concentration was reported in the January 2018 groundwater samples at concentrations less than the ADEC cleanup level of 1,500 µg/L.

The May 2018 sample from Well B6MW and the duplicate sample set B2MW/B4MW contained maximum benzene concentrations of 17.4 µg/L and 43.7 µg/L, respectively, which are greater than the ADEC cleanup level of 4.6 µg/L. Benzene was not detected in the remaining groundwater samples. Toluene was detected in groundwater Sample B1MW at an estimated concentration of 0.340 µg/L, which is less than the ADEC cleanup level of 1,110 µg/L. Cis-1,2-

dichloroethene and MTBE were detected in both samples of the duplicate sample set B2MW/B4MW and Sample B6MW at concentrations less than the applicable ADEC cleanup levels. Other VOCs were not detected in the groundwater samples. DRO concentrations were detected in Sample set B2MW/B4MW and Samples B5MW and B6MW at concentrations less than the ADEC cleanup level of 1,500 µg/L. While the detected and estimated concentrations of DRO are consistent with historical data, it appears no clear DRO trend has been established.

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 D).

External quality controls included duplicate samples and trip blanks. Two duplicate sets, one soil (B5S3/B5S23) and one groundwater (B2MW/B4MW), were 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 50 percent for soil and 30 percent for groundwater, with the exception of MTBE in the January 2018 groundwater sample set B2MW/B4MW (64.94%). MTBE was detected at below the ADEC cleanup criterion during both January and May 2018 sampling events. Therefore, it is our opinion that the RPD failure does not impact data usability for the objectives of this project.

One methanol soil trip blank (Sample TB) and two water trip blanks (Sample TB and WTB) accompanied the sample jars and bottles, as appropriate, from the laboratory to the site during sampling activities and back again to SGS. The soil trip blank was submitted to the laboratory without methanol or it leaked and could not be analyzed, therefore it is unknown if cross-contamination occurred during transport to the laboratory. Target analytes were not detected in the water trip blanks; therefore, the usability of the groundwater data is considered not adversely affected.

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, which is included in Appendix D. No non-conformances that would adversely affect the quality or usability of the data were noted, except for the following:

- An estimated concentration of DRO (217 µg/L) was detected in the laboratory method blank associated with the May 2018 groundwater samples. Estimated concentrations of DRO were also detected in Samples B2MW, B4MW, B5MW, and B6MW. These results are consistent with previous results; therefore, the DRO results of these four samples are flagged "B" at the detected concentration in Table 4. DRO was also detected in Samples B1MW and B3MW at concentrations greater than the LOQ and less than 5 times the method blank concentration, therefore these results are flagged "B" and reported as non-detect at the reported sample concentrations in Tables 4 and 5.

7.0 CONCLUSIONS

The additional release investigation activities consisted of advancing four boring (B5 through B8), installing and developing two groundwater monitoring wells (B5MW and B6MW), and collecting soil and groundwater samples. A soil sample collected from Boring B7 (B7S4) contained DRO in excess of the applicable ADEC Method Two cleanup level. The sample was collected from peat and according to the laboratory, the moisture content and the absence of alkane peaks in the chromatogram associated with the sample are both indicative of biogenic origins (naturally occurring organics) and not petroleum hydrocarbons. DRO was not detected in Sample B7S5 which was collected from silt about 10-12.5 feet beneath Sample B7S4 or in the samples collected from Boring B8. DRO concentrations detected in the remaining soil samples are below ADEC Method Two cleanup levels.

The groundwater samples collected in January and May 2018 contained DRO at concentrations less than ADEC cleanup levels and are within historical values. Benzene was detected at concentrations greater than the ADEC cleanup level in the groundwater samples collected from Well B2MW and Well B6MW. Concentrations of target analytes exceeding the ADEC Table C cleanup levels were not detected in the sample from downgradient Well B5MW.

Based on soil analytical results, it is our opinion that DRO contamination in soil is bound to the north of the former UST excavation by Borings B7 and B8. Based on groundwater samples collected downgradient of the former tank, benzene-impacted groundwater does not appear to migrate into the West 67th Avenue right-of-way.

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. As a result, 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 assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations 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 Warning Lites of Alaska, or as required by law.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information derived from electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report, please contact the undersigned.

Shannon & Wilson has prepared the information in Appendix E, "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 Jessa H. Tibbetts or the undersigned at (907) 561-2120.

SHANNON & WILSON, INC.

Jessa Tibbetts
Environmental Scientist

Dan P. McMahon
Associate

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2 and Appendix C)	Depth (feet bgs or BTOC)	Headspace (ppm) ^
Soil Samples				
Boring B5				
B5S1	1/4/2018	Boring B5, Sample 1	0.2-2.5	0.1
B5S2	1/4/2018	Boring B5, Sample 2	2.5-5	0.1
* B5S3	1/4/2018	Boring B5, Sample 3	5-7.5	0.0
* B5S23	1/4/2018	Duplicate of Sample B5S3	5-7.5	0.0
B5S4	1/4/2018	Boring B5, Sample 4 (No Recovery)	7.5-10	-
B5S5	1/4/2018	Boring B5, Sample 5 (No Recovery)	10-12.5	-
Boring B6				
B6S1	1/4/2018	Boring B6, Sample 1	0.5-2.5	0.1
B6S2	1/4/2018	Boring B6, Sample 2	2.5-5	0.9
B6S3	1/4/2018	Boring B6, Sample 3	5-7.5	-
* B6S4	1/4/2018	Boring B6, Sample 4	7.5-10	2.2
Boring B7				
B7S1	1/4/2018	Boring B7, Sample 1	0-2.5	2.2
B7S2	1/4/2018	Boring B7, Sample 2	2.5-5	0.5
B7S3	1/4/2018	Boring B7, Sample 3	5-7.5	5.3
* B7S4	1/4/2018	Boring B7, Sample 4	7.5-10	6.0
* B7S5	1/4/2018	Boring B7, Sample 5	10-12.5	0.4
B7S6	1/4/2018	Boring B7, Sample 6	12.5-15	-
Boring B8				
B8S1	1/4/2018	Boring B8, Sample 1	0.5-2.5	1.1
B8S2	1/4/2018	Boring B8, Sample 2	2.5-5	0.1
B8S3	1/4/2018	Boring B8, Sample 3	5-10	-
* B8S4	1/4/2018	Boring B8, Sample 4	10-12.5	0.6
Water Samples				
***** B2MW	1/11/2018	Monitoring Well B2MW	7.00	-
***** B4MW~	1/11/2018	Duplicate of Sample B2MW	7.00	-
***** B1MW	5/22/2018	Monitoring Well B1MW	4.19	-
***** B2MW	5/22/2018	Monitoring Well B2MW	3.45	-
***** B4MW~	5/22/2018	Duplicate of Sample B2MW	3.45	-
***** B3MW	5/22/2018	Monitoring Well B3MW	3.35	-
***** B5MW	5/22/2018	Monitoring Well B5MW	2.63	-
***** B6MW	5/22/2018	Monitoring Well B6MW	3.44	-
Quality Control Samples				
* TB	1/11/2018	Water Trip Blank	-	-
* TB	5/22/2018	Water Trip Blank	-	-

Notes:

* = Sample analyzed by the project laboratory (See Tables 3 and 4)

** = Sample description applies to the portion of the specified sample interval from which the sample

^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detec

\- = Measurement not recorded or not applicable

bgs = below ground surface

BTOC = Below top of casing (in feet)

ppm = parts per million

TABLE 2.1
JANUARY 2018 MONITORING WELL DEVELOPMENT & SAMPLING LOG

	Monitoring Well Number				
	B1MW	**B2MW**	**B3MW**	**B5MW**	**B6MW**
Development Data					
Development Date	-	-	-	1/11/18	1/11/2018
Measured Depth to Water (ft below TOC)^	-	-	-	7.01	7.03
Total Depth of Well (ft below TOC)	-	-	-	11.82	11.56
Water Column in Well (ft)	-	-	-	4.81	4.53
Gallons per Foot	-	-	-	0.16	0.16
Water Column Volume (gallons)	-	-	-	0.77	0.72
Total Volume Pumped/Bailed (gallons)	-	-	-	2.75	3.0
Development Method	-	-	-	Surge block/ Submersible pump	Surge block/ Submersible pump
Water Level Measurement Data					
Date Water Level Measured	1/11/2018	1/11/18	1/11/18	1/11/2018	1/11/2018
Time Water Level Measured	10:38	10:58	10:15	11:14	11:04
Surveyed TOC Elevation (ft)	97.00	95.95	96.68	-	-
Measured Depth to Water (ft below TOC)^	6.52	7.00	6.79	7.01	7.03
Water Level Elevation (ft)	90.48	88.95	89.89	-	-
Sampling Data					
Date Sampled	-	1/11/2018	-	-	-
Time Sampled	-	13:05	-	-	-
Measured Depth to Water (ft below TOC)	-	7.00	-	-	-
Total Depth of Well (ft below TOC)	-	13.20	-	-	-
Water Column in Well (ft)	-	6.20	-	-	-
Gallons per Foot	-	0.16	-	-	-
Water Column Volume (gallons)	-	0.99	-	-	-
Total Volume Pumped/Bailed (gallons)	-	1.1	-	-	-
Sampling Method	-	SP	-	-	-
Diameter of Well Casing	-	2-inch	-	-	-
Water Quality Data					
Temperature (°C)	-	4.8	-	3.5	2.8
pH (Standard Units)	-	5.39	-	4.60	6.13
Specific Conductivity (µS/cm)	-	248	-	2	38
Oxidation Reduction Potential (m/V)	-	21.6	-	192	34.1
Turbidity (NTU)	-	9.59	-	>1,000	>1,000
Remarks	Water levels only	Duplicate Sample B4MW	Water levels only	Well purged dry during development.	Well purged dry during development.

Notes:

Water quality parameters were measured with Hanna and Hach Instruments

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

TABLE 2.2
MAY 2018 MONITORING WELL DEVELOPMENT & SAMPLING LOG

	Monitoring Well Number				
	B1MW	**B2MW**	**B3MW**	**B5MW**	**B6MW**
Development Data					
Development Date	-	-	-	5/21/18	5/21/2018
Measured Depth to Water (ft below TOC)^	-	-	-	2.63	3.44
Total Depth of Well (ft below TOC)	-	-	-	11.85	11.57
Water Column in Well (ft)	-	-	-	9.22	8.13
Gallons per Foot	-	-	-	0.16	0.16
Water Column Volume (gallons)	-	-	-	1.48	1.30
Total Volume Pumped/Bailed (gallons)	-	-	-	29.5	9.25
Development Method	-	-	-	Surge block/ Submersible pump	Surge block/ Submersible pump
Water Level Measurement Data					
Date Water Level Measured	5/21/2018	5/21/2018	5/21/2018	5/21/2018	5/21/2018
Time Water Level Measured	9:45	10:00	9:50	10:20	10:10
Surveyed TOC Elevation (ft)	98.45	97.53	98.03	96.88	97.38
Measured Depth to Water (ft below TOC)^	4.19	3.45	3.35	2.63	3.44
Water Level Elevation (ft)	94.26	94.08	94.68	94.25	93.94
Sampling Data					
Date Sampled	5/22/2018	5/22/2018	5/22/2018	5/22/2018	5/22/2018
Time Sampled	14:15	12:45	15:55	10:20	10:50
Measured Depth to Water (ft below TOC)	4.19	3.45	3.35	2.63	3.44
Total Depth of Well (ft below TOC)	13.25	13.20	13.15	11.85	11.57
Water Column in Well (ft)	9.06	9.75	9.80	9.22	8.13
Gallons per Foot	0.16	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	4.19	1.56	1.57	1.48	1.30
Total Volume Pumped/Bailed (gallons)	1.5	1.6	1.6	-	-
Sampling Method	SP	SP	SP	SP	SP
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch
Water Quality Data					
Temperature (°C)	8.0	3.4	6.8	5.9	4.1
pH (Standard Units)	6.03	4.97	5.86	5.17	6.72
Specific Conductivity (µS/cm)	131	434	911	429	171
Oxidation Reduction Potential (m/V)	74.1	114	43.3	174.1	116.1
Turbidity (NTU)	21.1	3.86	6.20	9.68	18.41
Remarks		Duplicate Sample B4MW		Well purged dry three times during development	Well purged dry two times during development

Notes:

Water quality parameters were measured with Hanna and Hach Instruments

Well survey conducted by Shannon & Wilson on June 8, 2018.

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

TABLE 3
SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number^ and Soil Sample Depth in Feet bgs (See Table 1, Figure 2, and Appendix C)					
			Boring B5		Boring B6	Boring B7		Boring B8
			B5S3	B5S23	B6S4	B7S4	B7S5	B8S4
			5-7.5	5-7.5	7.5-10	7.5-10	10-12.5	10-12.5
PID Headspace Reading - ppm	580B PID	-	0.0	0.0	2.2	6.0	0.4	0.9
Diesel Range Organics (DRO) - mg/kg	AK 102	250	**18.6 J**	**29.9**	**30.4**	**534**	<11.3	<11.3
Volatile Organic Compounds (VOCs)								
Benzene - mg/kg	EPA 8260C	0.022	<0.00915	<0.0104	<0.0127	**<0.0595**	<0.00740	<0.00555
Toluene - mg/kg	EPA 8260C	6.7	<0.0183	<0.0209	<0.0254	<0.119	<0.0148	<0.0111
Ethylbenzene - mg/kg	EPA 8260C	0.13	<0.0183	<0.0209	<0.0254	<0.119	<0.0148	<0.0111
Xylenes (total) - mg/kg	EPA 8260C	1.5	<0.0550	<0.0625	<0.0760	<0.357	<0.0443	<0.0333
Methyl-t-butyl ether (MTBE) - mg/kg	EPA 8260C	0.40	<0.0735	<0.0835	**0.243**	<0.476	<0.0590	<0.0444
Other VOCs - mg/kg	EPA 8260C	Varies	ND	ND	ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons (PAHs)								
1-Methylnaphthalene - mg/kg	EPA 8270D-SIM	0.41	-	-	**0.00826 J**	-	-	<0.0141
Phenanthrene - mg/kg	EPA 8270D-SIM	39	-	-	**0.0110 J**	-	-	<0.0141
Other PAHs - mg/kg	EPA 8270D-SIM	Varies	-	-	ND	-	-	ND

Notes:

*	= See Appendix D for compounds tested, methods, and laboratory reporting limits
**	= Soil cleanup level is the most stringent ADEC Method 2 standard listed in Table B1 or B2, 18 AAC 75 (November 2017), for the "under 40 inches (precipitation) zone
^	= Sample ID number preceded by "17604-" on the chain of custody form
mg/kg	= Milligram per kilogram
<0.00915	= Analyte not detected; laboratory limit of detection of 0.00915
<0.0595	= Laboratory limit of detection greater than cleanup level
29.9	= Analyte detected
534	= Reported concentration exceeds the ADEC cleanup level
ND	= Not detected
-	= Not applicable or sample not tested for this analyte
~	= Field duplicate of preceding sample
J	= Estimated concentration less than the limit of quantitation. See the SGS laboratory report for more details.
ppm	= part per million

TABLE 4
SUMMARY OF WATER ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (µg/L)**	Sample ID Number^, Sample Date, Water Depth in Feet BTOC (See Tables 1, 2.1 and 2.2; Figures 2.1 and 2.2; and Appendix C)									
			Monitoring Wells								Quality Control	
			1/11/2018		5/21/2018						1/11/2018	5/21/2018
			B2MW	B4MW~	B1MW	B2MW	B4MW~	B3MW	B5MW	B6MW	TB	WTB
			7.00	7.00	4.19	3.45	3.45	3.35	2.63	3.44	-	-
Diesel Range Organics (DRO) - µg/L	AK 102	1,500	**305 J**	**244 J**	**709 B**	**289 B**	**529 B**	**581 B**	**266 B**	**544 B**	-	-
Volatile Organic Compounds (VOCs)												
Benzene - µg/L	EPA 8260C	4.6	**38.6**	**51.7**	<0.200	**42.9**	**43.7**	<0.200	<0.200	**17.4**	<0.200	<0.200
Toluene - µg/L	EPA 8260C	1,100	<0.500	<0.500	**0.340 J**	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
Ethylbenzene - µg/L	EPA 8260C	15	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
Xylenes (total) - µg/L	EPA 8260C	190	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
cis-1,2-Dichloroethene - µg/L	EPA 8260C	36	**1.25**	**1.54**	<0.500	**1.26**	**1.25**	<0.500	<0.500	**2.09**	<0.500	<0.500
Methyl-t-butyl ether (MTBE) - µg/L	EPA 8260C	140	**51.2 E**	**26.1 E**	<5.00	**5.77 J**	**5.45 J**	<5.00	<5.00	**54.8**	<5.00	<5.00
Other VOCs - µg/L	EPA 8260C	Varies	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

*	= See Appendix D for compounds tested, methods, and laboratory reporting limits
**	= Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (November 2017)
^	= Sample ID number preceded by "17604-" on the chain of custody form
µg/L	= micrograms per liter
<0.500	= Analyte not detected; laboratory limit of detection of 0.500
42.9	= Reported concentration exceeds the regulated cleanup level
-	= Not applicable or sample not tested for this analyte
~	= Field duplicate of preceding sample
J	= Estimated concentration less than the limit of quantitation. See the SGS laboratory report for more details.
B	= Compound detected in method blank at an estimated concentration and may potentially affect the sample result.
E	= Result is an estimate due to a primary/field duplicate sample pair relative percent difference (RPD) failure.
BTOC	= Below Top of Casing

TABLE 5
HISTORICAL WATER ANALYTICAL RESULTS

Monitoring Well	Date	Depth to Groundwater (feet bgs)	Parameter Tested and ADEC Cleanup Level in µg/L					
			DRO 1,500	GRO 2,200	Benzene 4.6	Toluene 1,100	Ethylbenzene 15	Xylenes 190
B1MW	5/8/2014	4.15	<659 B	<50.0	**0.390 J**	<0.500	<1.00 B	<2.00 B
	8/3/2015	4.72	<300	<50.0	**0.680**	<0.500	<0.500	<1.50
	10/27/2015	3.55	**325 J**	<50.0	**0.610**	<0.500	<0.500	<1.50
	2/10/2016	7.11	<300	<50.0	**2.08 B**	<1.00 B	<0.500	<3.00 B
	5/25/2016	4.76	**338 J**	<50.0 J-	**0.330 J-**	<0.500 J-	<0.500 J-	<1.50 J-
	5/22/2018	4.19	**709 B**	-	<0.200	**0.340 J**	<0.500	<1.50
B2MW	5/8/2014	3.65	<682 B	**43.2 J**	**14.4**	<0.500	<0.500	<2.00 B
	8/3/2015	4.05	<308	**124**	**56.0**	<0.500	<0.500	<1.50
	10/27/2015	4.01	**379 J**	<109 B	**54.1**	<0.500	<0.500	<1.50
	2/10/2016	7.84	**320 J**	**124 E**	**37.4**	<0.500	<0.500	<2.00 B
	5/25/2016	4.22	**284 J**	**122 J-**	**63.6 J-**	<0.500 J-	<0.500 J-	<1.50 J-
	1/11/2018	7.00	**305 J**	**-**	**38.6**	<0.500	<0.500	<1.50
	5/22/2018	3.45	**289 B**	-	**42.9**	<0.500	<0.500	<1.50
B4MW~ (Duplicate of Sample B2MW)	8/3/2015	4.05	<300	**121.000**	**56.4**	<0.500	<0.500	<1.50
	10/27/2015	4.01	**384 J**	<111 B	**50.6**	**0.550 J**	<0.500	<1.50
	2/10/2016	7.84	**311 J**	**83.0 E**	**37.2**	<0.500	<0.500	<2.00 B
	5/25/2016	4.22	**354 J**	**120 J-**	**63.5 J-**	<0.500 J-	<0.500 J-	<1.50 J-
	1/11/2018	7.00	**244 J**	**-**	**51.7**	<0.500	<0.500	<1.50
	5/22/2018	3.45	**529 B**	-	**43.7**	<0.500	<0.500	<1.50
B3MW	5/8/2014~	3.00	<732 B	**45.1 J**	**0.220 J**	<0.500	<0.500	<2.00 B
	8/3/2015	3.83	**471 J**	<50.0	**0.330 J**	<0.500	<0.500	<1.50
	10/27/2015	3.33	**693**	<50.0	**0.230 J**	<0.500	<0.500	<1.50
	2/10/2016	7.37	**433 J**	<50.0	<0.500 B	<0.500	<0.500	<2.00 B
	5/25/2016	4.01	**746**	<50.0 J-	**0.160 J-**	<0.500 J-	<0.500 J-	<1.50 J-
	5/22/2018	3.35	**581 B**	-	<0.200	<0.500	<0.500	<1.50
B5MW	5/22/2018	2.63	**266 B**	-	<0.200	<0.500	<0.500	<1.50
B6MW	5/22/2018	3.44	**544 B**	-	**17.4**	<0.500	<0.500	<1.50
Trip Blank	5/8/2014	-	**-**	<31.0	<0.250	**0.340 J**	**0.510 J**	**1.70 J**
	8/3/2015	-	-	<50.0	<0.250	<0.500	<0.500	<1.50
	10/27/2015	-	-	<100 B	<0.250	<0.500	<0.500	<1.50
	2/10/2016	-	-	<50.0	**0.390 J**	**0.640 J**	**0.730 J**	**2.60 J**
	5/25/2016	-	-	<50.0 J-	<0.250 J-	<0.500 J-	<0.500 J-	<01.50 J-
	1/11/2018	-	-	-	0.000	<0.200	<0.200	<0.500
	5/22/2018	-	-	-	<0.200	<0.500	<0.500	<1.50

Notes:

*	= See Attachment 2 for compounds tested, methods, and laboratory reporting limits
**	= Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (November 2017)
^	= Sample ID number preceded by "17604-" on the chain of custody form
~	= Listed value based on highest concentration in duplicate sample set
µg/L	= micrograms per liter
<0.500	= Analyte not detected; laboratory limit of detection of 0.500 µg/L
325	= Analyte detected at a concentration less than the applicable ADEC cleanup level
14.4	= Reported concentration exceeds the applicable ADEC cleanup level
-	= Not applicable or sample not tested for this analyte
J	= Estimated concentration less than the limit of quantitation. See the SGS laboratory report for more details.
J-	= Biased low due to hold time exceedance. See the SGS laboratory report for more details.
B	= Analyte concentration potentially affected by compound detected in trip blank or method blank
E	= Result is an estimate due to a field-duplicate pair relative-percent-difference failure.
BTOC	= Below Top of Casing

Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth Mapping Service. Imagery date April 14, 2011

0 150 300

APPROXIMATE SCALE IN FEET

N

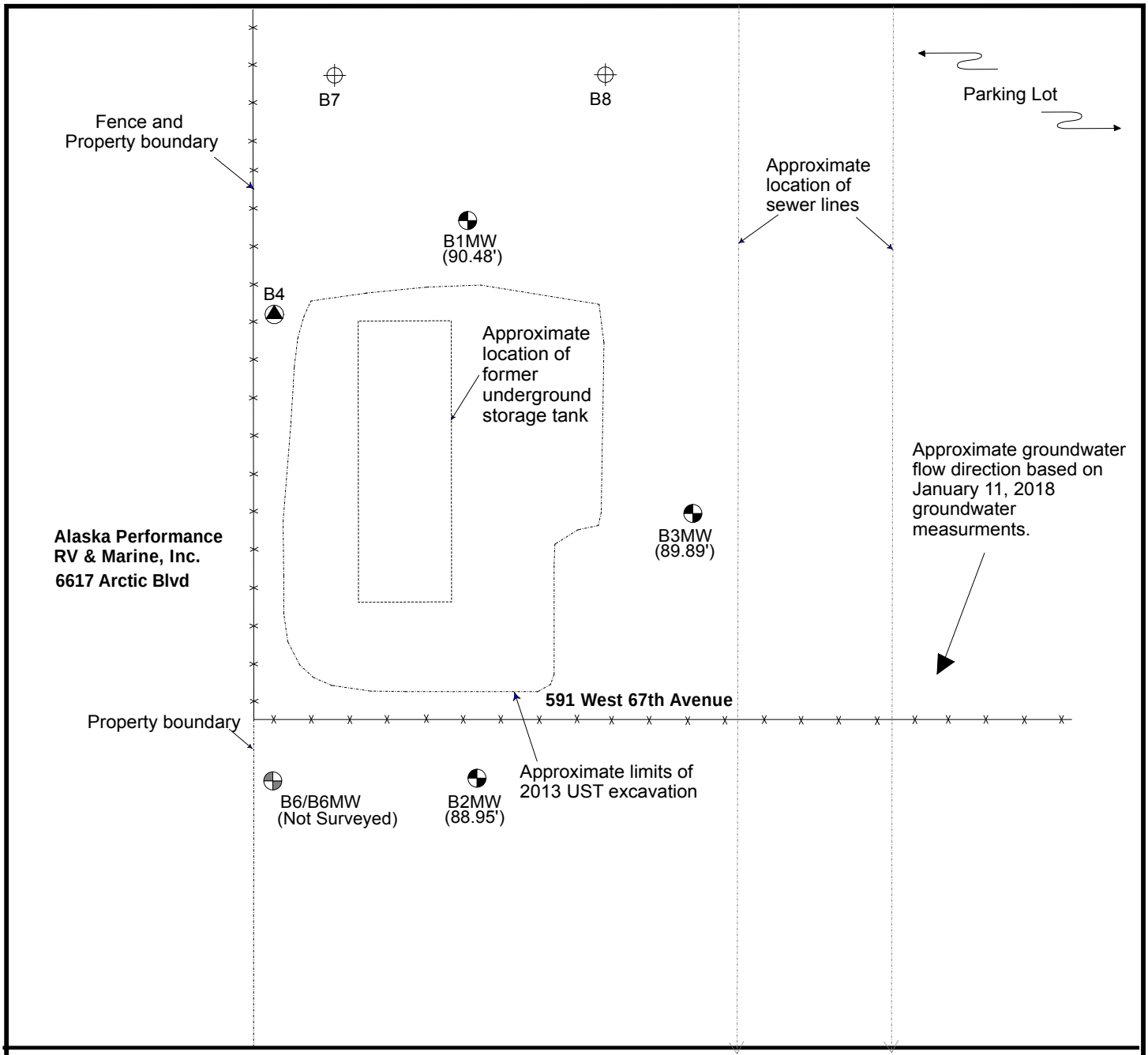
591 West 67th Avenue
Anchorage, Alaska

VICINITY MAP

August 2018 32-1-17604-004

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1



Legend

B4	Approximate location of Boring B4 advanced by Shannon & Wilson, Inc. on January 7, 2014
B7MW	Approximate location of Boring B7 advanced by Shannon & Wilson, Inc. on January 4, 2018
B5/B5MW	Approximate location of Boring B5 advanced by Shannon & Wilson, Inc. and completed as Monitoring Well B5MW on January 4, 2018.
B1MW (90.48')	Approximate location of Monitoring Well B1MW installed by Shannon & Wilson, Inc. on January 4, 2014 and water level elevations based on January 11, 2018 measurements and May 23, 2014 well casing elevation survey by Shannon & Wilson.

0 10 20

APPROXIMATE SCALE IN FEET

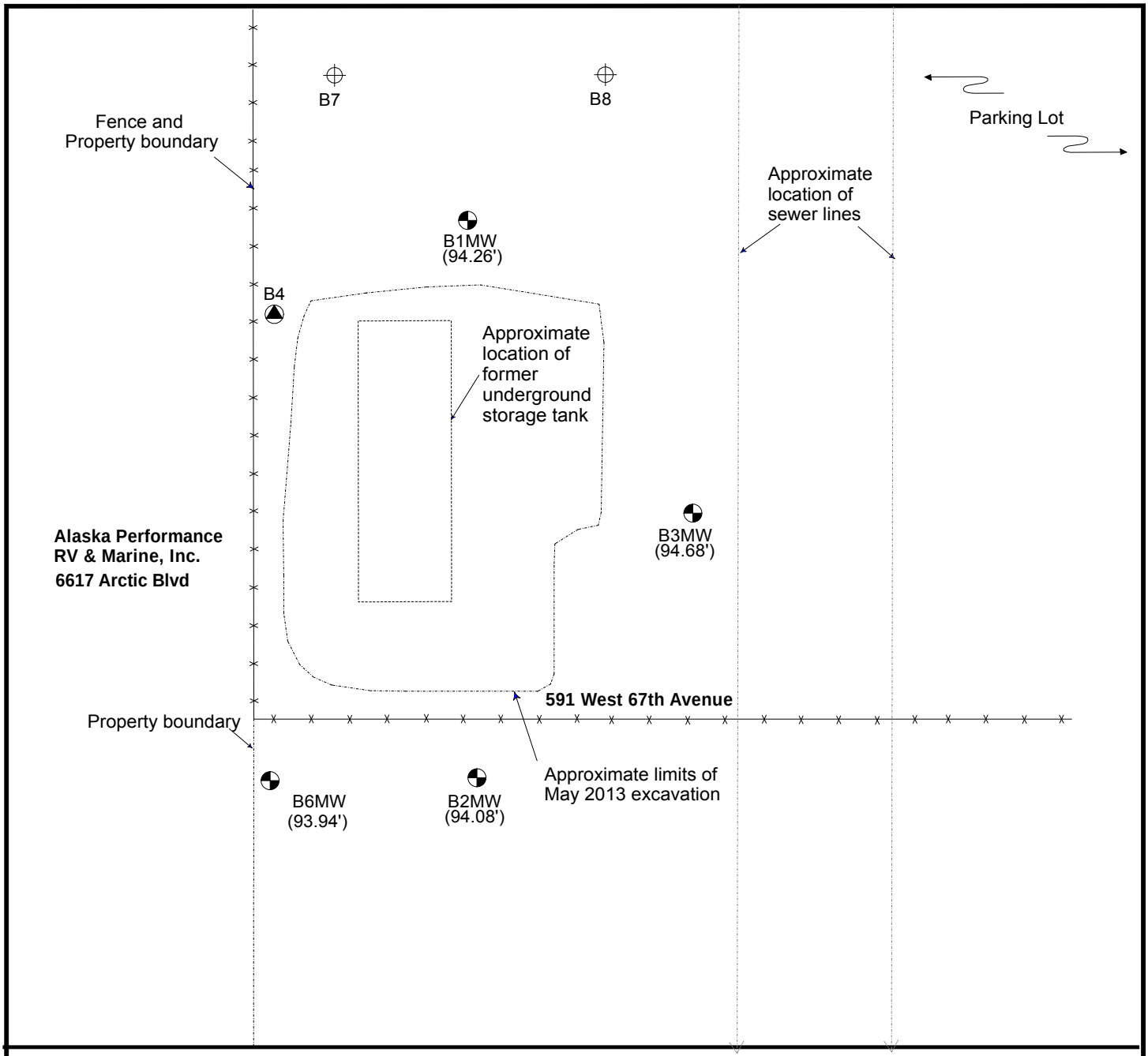
591 W. 67th Avenue
Anchorage, Alaska

JANUARY 2018
SITE PLAN

August 2018 32-1-17604-004

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

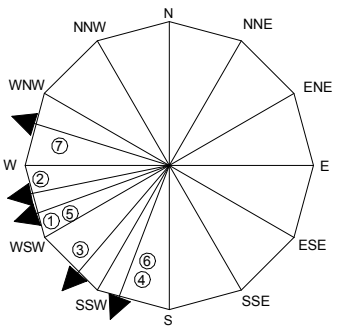
Fig. 2.1

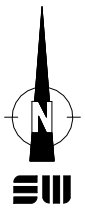


West 67th Avenue

B5MW
(94.25')

Groundwater flow direction and dates	
①	May 7, 2014
②	August 3, 2015
③	October 27, 2015
④	February 2, 2016
⑤	May 25, 2016
⑥	January 11, 2018
⑦	May 21, 2018





0 10 20

APPROXIMATE SCALE IN FEET

Legend

B4 — Approximate location of Boring B4 advanced by Shannon & Wilson, Inc. on January 7, 2014.

B7MW — Approximate location of Boring B7 advanced by Shannon & Wilson, Inc. on January 4, 2018.

B5MW (94.25') — Approximate location of Monitoring Well B5MW installed by Shannon & Wilson, Inc. on January 4, 2018. Monitoring Wells B1MW through B3MW were installed by Shannon & Wilson, Inc. on January 4, 2014. Water level elevations based on May 21, 2018 measurements and June 8, 2018 well casing elevation survey by Shannon & Wilson.

591 W. 67th Avenue
Anchorage, Alaska

MAY 2018
SITE PLAN

August 2018 32-1-17604-004

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 2.2

APPENDIX A

SITE PHOTOGRAPHS

Photo 1: Looking north during the advancement of Boring B5. (January 4, 2018)

Photo 2: Looking east, Boring B5 was completed as Monitoring Well B5MW. (January 4, 2018)

591 West 67th Avenue
Anchorage, Alaska

PHOTOS 1 AND 2

August 2018 32-1-17604-004

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

APPENDIX B

FIELD NOTES

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery - Matt
DRILL RIG EQUIPMENT: 420 Geoprobe 7822DT
DRILLING METHOD:
HAMMER TYPE: ROD TYPE/DIA.:
HAMMER WEIGHT: 340 HAMMER DROP:
CASING SIZE/TYPE: HOLE SIZE:

JOB NO: 17604-4 BORING NO: B5
JOB NAME: 591 W 67 AVE
LOGGED BY: Alena Voigt
LOCATION: 591 W 67 AVE ELEV.: —
START DATE: 1/4/2018 END DATE:
WEATHER DURING DRILLING: 20°F overcast

SAMPLE DATA

TIME / DATE	SAMP. NO. / TYPE	DEPTH FROM / TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. 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]
12:50 / 1/4	S1	0.2 / 2.5		2 / Y			0.1	G / S / F	0-0.2 Asphault Brown to light gray sand w/ gravel; moist; trace organics
12:55 / 1/4	S2	2.5 / 5		2 / Y			0.1	G / S / F	Same as above
* 13:10 / 1/4	S3	5 / 7.5		1 / Y			0.0	G / S / F	Gray Silt w/ Sand; moist Dup B5 S23 @ 14:10
13:15 / 1/4	S4	7.5 / 10		0 / N			—	G / S / F	No recovery - no sample taken
14:00 / 1/4	S5	10 / 12.5		0 / N			—	G / S / F	No recovery - no sample taken
								G / S / F	
								G / S / F	

SUMMARY FIELD LOG OF BORING

DEPTH FROM	DEPTH TO	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG

COMMENTS (i.e. materials used, visitors, problems, etc.):
Duplicate from Sample 3 S23
Could not tell where water was. Will install GW well of 12' w/ 10' Screen via Jessa.

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE DRILLED: 12.5 SAMPLES: Attempted / Recovered
DRILL/SAMPLE hrs. STANDBY: hrs.
SETUP/CLEANUP: hrs. WELL INSTALL: hrs.
OTHER:

BORING: B5 SHEET 1 OF 1

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery - Matt + Tommy
DRILL RIG EQUIPMENT: 420 GeoProbe 7822DT
DRILLING METHOD:
HAMMER TYPE: ROD TYPE/DIA.:
HAMMER WEIGHT: 340 HAMMER DROP:
CASING SIZE/TYPE: HOLE SIZE:

JOB NO: 17604-4 BORING NO: B6
JOB NAME: 591 W 67 AVE
LOGGED BY: Alena Voigt
LOCATION: 591 W 67 AVE ELEV.: —
START DATE: 1/4/2018 END DATE:
WEATHER DURING DRILLING: ~20°F, overcast

SAMPLE DATA

	TIME / DATE	SAMP. NO. / TYPE	DEPTH FROM / TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. 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]
	1553	S1	0.5		2			0.1	G	0 - 0.5 Asphalt
	1/4		2.5		Y				S	0.5 - Brown Sand w/ Gravel; frozen
									F	
	1600	S2	2.5		2			0.9	G	2.5-4 Brown Sand w/ Gravel; frozen
	1/4		5		Y				S	4-5 Brown peat; moist
									F	Sample from 3-4
	1610	S3	5		2			-	G	Brown peat; moist
	1/4		7.5		N				S	
									F	No sample taken
*	1615	S4	7.5		2			22	G	7.5 - 8.5 Brown Peat; moist
	1/4		10		Y				S	8.5 - 9.5 Gray silt; moist
									F	Sample from 8.5 - 9.5
									G	
									S	
									F	
									G	
									S	
									F	
									G	
									S	
									F	

SUMMARY FIELD LOG OF BORING

DEPTH FROM	DEPTH TO	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG

COMMENTS (i.e. materials used, visitors, problems, etc.):
Could not tell where water was
Well installed @ 12' w/ 10' screen
per Jessa.

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

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

BORING: B6 SHEET 1 OF 1

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery - Matt + Tommy
DRILL RIG EQUIPMENT: 420 Geoprobe 7822 DT
DRILLING METHOD:
HAMMER TYPE: ROD TYPE/DIA.:
HAMMER WEIGHT: 340 HAMMER DROP:
CASING SIZE/TYPE: HOLE SIZE:

JOB NO: 17604-004 BORING NO: B7
JOB NAME: 591 W 67 AVE
LOGGED BY: Mena Voigt
LOCATION: 591 W 67 AVE ELEV.: —
START DATE: 1/4/18 END DATE:
WEATHER DURING DRILLING: 20° overcast

SAMPLE DATA

TIME / DATE	SAMP. NO. / TYPE	DEPTH FROM / TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. Env. Sample (Y/N)	DRILL ACTION	CONTACTS / GROUNDWATER	PID	CONST. % G / S / F	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1025	S1	0		2			2.2	G	Brown Sand w/ gravel; frozen
1/4		2.5		Y				S	
								F	
1030	S2	2.5		2			.5	G	Gray to brown sand w/ silt and gravel; moist
1/4		5		Y				S	
								F	
1125	S3	5		1.5			5.3	G	Brown Peat; moist
1/4		7.5		Y				S	
								F	
* 1130	S4	7.5		1.5			6.0	G	Same as above
1/4		10		Y				S	
								F	
* 1145	S5	10		1.5			.4	G	Gray Silt w/ sand
1/4		12.5		Y				S	water seems to be @ 10'
								F	couldn't tell
1150	S6	12.5		1.5			—	G	Gray silt w/ sand; wet
1/4		15		N				S	no sample taken
								F	
								G	
								S	
								F	

SUMMARY FIELD LOG OF BORING

DEPTH FROM	DEPTH TO	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG

COMMENTS (i.e. materials used, visitors, problems, etc.):
Couldn't tell where water was
Peat

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

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

BORING: B7 SHEET 1 OF 1

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery - Matt + Tommy
DRILL RIG EQUIPMENT: 420 Geoprobe 7822DT
DRILLING METHOD:
HAMMER TYPE: ROD TYPE/DIA.:
HAMMER WEIGHT: 340 HAMMER DROP:
CASING SIZE/TYPE: HOLE SIZE:

JOB NO: 17604-4 BORING NO: B8
JOB NAME: 591 W 67 AVE
LOGGED BY: Alena Voigt
LOCATION: 591 W 67 AVE ELEV.:
START DATE: 1/4/18 END DATE: 1/4/18
WEATHER DURING DRILLING: 20° overcast

SAMPLE DATA

TIME / DATE	SAMP. NO. / TYPE	DEPTH FROM / TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. Env. Sample (Y/N)	DRILL ACTION	CONTACTS / GROUNDWATER	PID	CONST. % G / S / F	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
12:00 / 1/4	S1	0 / 2.5		1.5 / Y			1.1		Brown Sand w/ Gravel; moist
12:05 / 1/4	S2	2.5 / 5		1.5 / Y			0.1		Gray to brown Peat w/ layers of Sand; moist
12:15 / 1/4	S3	5 / 10		1.5 / N			—		Peat; moist no sample taken
1/4		7.5 / 10		1.0 / N			—		Peat; moist no sample taken
X 12:20 / 1/4	S4	10 / 12.5		1.0 / Y			0.6		Gray Sand w/ layers of Peat; moist to wet

SUMMARY FIELD LOG OF BORING

DEPTH FROM	DEPTH TO	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG

COMMENTS (i.e. materials used, visitors, problems, etc.):
Couldn't tell where water was.
Peat

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

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

BORING: B8 SHEET 1 OF 1

MONITORING WELL CONSTRUCTION DETAILS

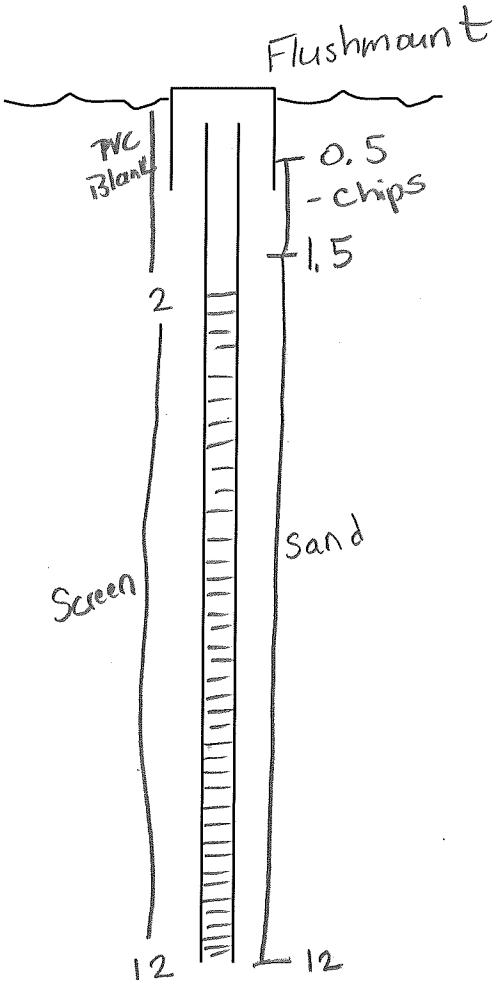
Shannon & Wilson, Inc.

Job No: 17604-4 Project: 591 West 67th Ave

Weather: 20's, overcast

Well No.: B5MW

Date: 1/4/2018 Time Started: 1430 Time Completed: 1550



WELL DATA:

Pipe Type: PVC

Diameter: 2 in

Total Depth (ft bgs): 12'

Well Screen Interval (feet): 10'

Top of Well Screen (ft bgs): 2'

Slot size: 0.010

Casing Connection: Threaded

Depth below surface: 3" N/A ☐

Casing stickup: _____ N/A ☑

PACKING MATERIAL:

	Depth below ground surface: From	To
Asphalt Patch		
~~Soil Cuttings~~ Sand 10-20	0.2	0
Sand (~~20-40~~):	0.5	0.2
Bentonite chips:	1.5	0.5
Sand (~~20-40~~) 10-20:	12	1.5

MONUMENT:

Flush Mount ☑ Post ☐

Monument height: _____ N/A ☑

Monument Diameter: 6" N/A ☐

LOCK:

Type: NA

Combination: NA

Length cutoff last section: NA

Remarks: _____

Time between installation/development: 1/4/18 -

Engineer or Geologist: ADV

MONITORING WELL CONSTRUCTION DETAILS

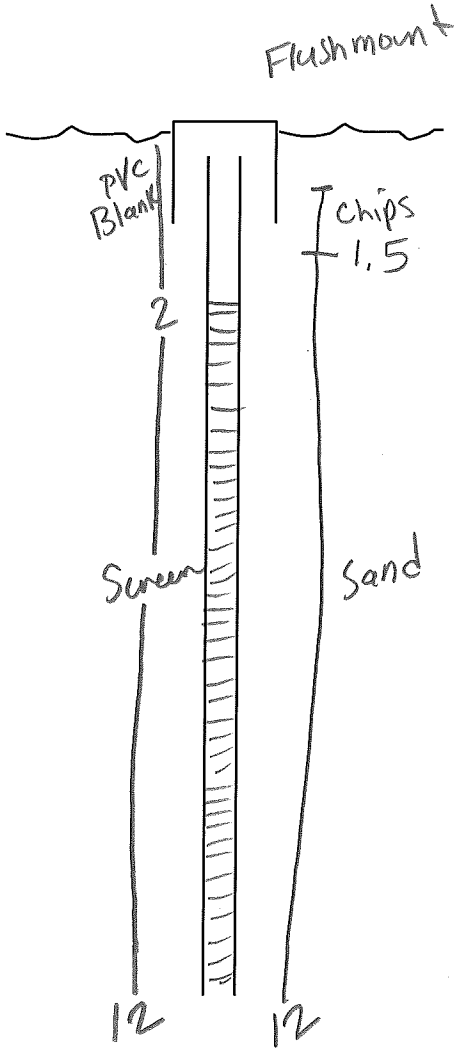
Shannon & Wilson, Inc.

Job No: 17604-4 Project: 591 West 67th AVE

Weather: 20's overcast

Well No.: B6MW

Date: 1/4/2018 Time Started: 1625 Time Completed: 1740



WELL DATA:

Pipe Type: PVC

Diameter: 2in

Total Depth (ft bgs): 12'

Well Screen Interval (feet): 10'

Top of Well Screen (ft bgs): 2'

Slot size: 0.010

Casing Connection: Threaded

Depth below surface: 3" N/A ☐

Casing stickup: _____ N/A ☑

PACKING MATERIAL:

	Depth below ground surface: From	To
Soil Cuttings:	0.2	0
Sand (~~20~~-40): 10-20	0.5	0.2
Bentonite chips:	1.5	0.5
Sand (~~20~~-40): 10-20	12	1.5

MONUMENT:

Flush Mount ☑ Post ☐

Monument height: _____ N/A ☑

Monument Diameter: 6" N/A ☐

LOCK:

Type: N/A

Combination: NA

Length cutoff last section: NA

Remarks: _____

Time between installation/development: 1/4/18 -

Engineer or Geologist: ADV

FIELD ACTIVITIES DAILY LOG

Date 1/4/2018
Sheet 1 of 1
Project No. 17604-4

Project Name: 591 West 67th AVE
Field activity subject: Geotechnical borings + Installing TWO GW MW's
Description of daily activities and events:

8:30 MOB @ StW office

8:50 on-site, Meet w/ Discovery (Matt + Tommy)

Snowed and plowed since Utility locates, called Jessa, called AK Dig Line

Unloaded Geoprobe - Started leaking - Matt had to call Jesse from Discovery to come out to help fix; Was able to fix it.

10:15 Setting up on B7
GeoProbe led King again → stop to fix - fixed
Couldn't tell where water level is - called Jessa
Peat layers

11:15 Setting up on B8
Coulnt tell where water level was; Peat layers
called Jessa

12:45 Setting up on B5
Well Installation from 1430 - 1550
Well set @ 12' w/ 10' screen per Jessa

1552 Setting up on B6
Geoprobe cable tangeled - took some time to fix
Well Installatim from 1625 - 1740
Well set @ 12' w/ 10' screen per Jessa
1745 Cleaning up site / Drums to SW corner of lot locking gate per Rochell request since after 5
1830 Back @ StW DEMOB

Visitors on site:

Changes from plans/specifications and other special orders and important decisions:

Weather conditions: 20's overcast

Important telephone calls: Jessa PM regarding GW depth + GW MW Instalment

Personnel on site: ADV

Signature: Arena Voigt Date: 1/4/2018

FIELD ACTIVITIES DAILY LOG

Date 1/11/2018
Sheet 1 of 1
Project No. 32-1-17604-4

Project Name: 591 West 67th Avenue; Warning Lights of Alaska, Inc
Field activity subject: 2 Well Development + 3 well Sampling
Description of daily activities and events:

0830 MOB @ S+W office → calibrated YSI#1 + Turb#3 @ 900
1000 onsite @ Warning Lights of Alaska Inc.
1005 Locating Wells for DTW

1015 B3MW DTW = 6.79 TD = 13.15 → had to chip ice to get to Plug / gs - plug full of ice

1038 B1MW DTW = 6.52 TD = 13.26 → had to chip ice to get to plug / g.s - plug full of ice needs new plug
* no plug currently in well

1058 B2MW DTW = 7.00 TD = 13.20

1104 B6MW DTW = 7.03 TD = 11.56

1114 B5MW DTW = 7.01 TD = 11.82

1120 called Jessa to talk about 55-gallon drums.

1140 Setting up on B2MW
Sample time @ 13:05 B MW Duplicate - sample time 1315

1340 Setting up on B6MW
Well purged dry on 1st Surge/purge Cycle - 3 gallons purged
Call Jessa + Dan → move to B5MW per Dan + Jessa

1455 Setting up on B5MW
Well purged dry on 1st Surge/Purge Cycle - 2.75 gallons purged

1520 Checked B6MW DTW → 8.70' Not 80% recovered
1535 called Dan → Packing up + Heading back to S+W
1630 DEMOB @ S+W

Visitors on site:

Changes from plans/specifications and other special orders and important decisions:

Weather conditions: 14° overcast

Important telephone calls: Jessa + Dan regarding workplan + Wells Purging day

Personnel on site: Alena Voigt
Signature: Alena Voigt Date: 1/11/2018

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-4 Location: 591 West 67th Ave Weather: 14° overcast

Well No.: B2MW

Date: 1/11/2018 Time Started: 1140 Time Completed: 13:30

Develop Date: - Develop End Time: - (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1068 Date of Depth Measurement: 1/11/2018

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

Diameter of Casing: 2in Well Screen Interval:

Total Depth of Well Below MP: 13.20 Product Thickness, if noted: -

Depth-to-Water (DTW) Below MP: 7.00

Water Column in Well: 6.20 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 0.992 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 1/11/2018 Time Started: 12:00 Time Completed: 13:20

Three Well Volumes: 2.97 (Gallons in Well x 3) 1 FT below water column

Gallons Purged: 1.1 Depth of Pump (~~generally 2 ft from bottom~~): 8.00'

Max. Drawdown (generally 0.3 ft): 0.98 Pump Rate: 0.1 L/Min

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) 3%	Sp. Cond.: (uS/cm) 3%	DO: (mg/L)	pH: (S.U.) .1	ORP: (mV) ±10	Turb: (NTU) >10/10%
1203	0.1	0.1	7.30	.30	3.75	289		4.25	99.6	84.94
1206	0.1	0.1	7.40	.40	2.69	291		3.54	124.6	42.64
1209	0.2	0.1	7.42	.42	2.73	267		3.14	141.3	46.30
1212	0.2	0.1	7.48	.48	2.04	255		2.86	166.3	41.60
1215	0.3	0.1	7.52	.52	1.66	254		2.74	172.8	39.76
1218	0.3	0.1	7.60	.60	1.55	253		2.75	171.0	41.02

SAMPLING DATA

Odor: None Noted Color: Clear

Sample Designation: 17604-B2MW Time / Date: 13:05 / 1/11/2018

QC Sample Designation: 17604-B4 MW Time / Date: 13:15 / 1/11/2018

QA Sample Designation: - Time / Date: -

Evacuation Method: Submersible Pump / Other: miniwhale

Sampling Method: Submersible Pump / Other: miniwhale

Water Quality Instruments Used/Manufacturer/Model Number YSI, Turbidimeter, WLI

Calibration Info (Time, Ranges, etc) See 1/11/18 Field Notes

Remarks:

Sampling Personnel: ADV

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.

Continued from previous page

Job No: 32-1-17604-4 Location: 591 West 67th Ave Site: Warning Lights of Alaska Inc

Well No.: B2 MW

Date: 1/11/2018

80% 8.24' 1hr @ 1303

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)
1221	0.4	0.1	7.68	.68	1.59	252		2.86	163.2	40.20
1224	0.4	0.1	7.70	.70	1.61	252		2.97	157.6	35.72
1227	0.5	0.1	7.74	.74	1.50	252		3.21	149.5	31.45
1230	0.5	0.1	7.76	.76	1.40	251		3.32	144.9	25.18
1233	0.6	0.1	7.78	.78	1.32	251		3.37	142.8	22.90
1236	0.6	0.1	7.80	.80	1.09	251		3.45	138.5	25.73
1239	0.7	0.1	7.82	.82	.98	251		3.41	139.0	29.42
1242	0.7	0.1	7.84	.84	.92	250		3.36	130.8	21.20
1245	0.8	0.1	7.86	.86	2.00	251		2.97	141.5	21.55
1248	0.8	0.1	7.88	.88	4.17	242		3.58	105.4	17.51
1251	0.9	0.1	7.90	.90	4.71	242		4.47	70.3	16.85
1254	0.9	0.1	7.92	.92	4.88	244		4.80	49.5	15.54
1257	1.0	0.1	7.94	.94	4.95	245		5.12	37.9	11.41
1300	1.0	0.1	7.96	.96	4.93	247		5.28	27.0	12.56
1303	1.1	0.1	7.98	.98	4.84	248	↓	5.39	21.6	9.59
1305	Sample time									
	Drawdown + parameters did not stabilize; 1 hour + 1 well volume + 80% water column befor samping achieved									

	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.

WELL PURGED DRY LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-4 Location: 591 W. 67th AVE Weather: 14° overcast

Concern: _____ Well No.: B2MW

Date: 1/11/2018 Time Started: — Time Completed: —

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1058 Date of Depth Measurement: 1/11/2018

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

Diameter of Casing: 2in Well Screen Interval: —

Total Depth of Well Below MP: 13.20 Product Thickness, if noted: —

Depth-to-Water (DTW) Below MP: 7.00

Water Column in Well: 6.20 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 0.992 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 1/11/2018 Time Started: _____ Time Completed: _____

80% Recovery Water Column: 6.20 x 0.8 (Water Column in Well x 0.8) = 4.96

80% Recovery DTW: 8.24' (Initial DTW + (Water Col. – 80% Recovery Water Col.)

7.00 + (6.20 - 4.96)

7.00 + 1.24 = 8.24

Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate

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)

SAMPLING DATA

Odor: _____ Color: _____

Sample Designation: _____ Time / Date: _____

QC Sample Designation: _____ Time / Date: _____

QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Whale Pump/Bladder Pump / Other: _____

Sampling Method: Whale Pump/Bladder Pump / Other: _____

Remarks: _____

Sampling Personnel: _____

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: 32-1-17604-4 Location: 591 West 67th AVE Weather: 14° overcast

Concern: _____ Well No.: B5 MW

Develop Date: 1/11/2018 Time Started: 1455 Time Completed: _____

PURGING DATA

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

Time of Depth Measurement: 1114

Diameter of Casing: 1" ☐ 2" ☑

Total Depth of Well Below MP: 11.82

Depth-to-Water (DTW) Below MP: 7.01

Water Column in Well: 4.81 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 0.77 (Water Column in Well x Gallons per foot)

Three Well Volumes: 2.31 (Gallons in Well x 3)

Gallons Purged: 2.75

80% Well = 7.97'

DEVELOPMENT DATA

Odor: _____ Color: _____

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
1519	2.75	3.45	2	4.60	191.7	1000

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	1510-1515 (5)	2.75	~ 4 - Well Purged Dry
2			
3			
4			
5			
6			

Evacuation Method: Proactive Pump / Other: mini whale Surge Block: PVC Surge Block

Remarks: _____

Sampling Personnel: ADV

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WELL PURGED DRY LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-4 Location: 591 W. 67th AVE Weather: 14° overcast

Concern: _____ Well No.: B5MW

Date: 1/11/2018 Time Started: — Time Completed: —

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 11:14 Date of Depth Measurement: 1/11/2018

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

Diameter of Casing: 2inch Well Screen Interval: —

Total Depth of Well Below MP: 11.82 Product Thickness, if noted: —

Depth-to-Water (DTW) Below MP: 7.01

Water Column in Well: 4.81 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 2.31 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 1/11/2018 Time Started: 1510 Time Completed: _____

80% Recovery Water Column: 4.81 x 0.80 (Water Column in Well x 0.8)

80% Recovery DTW: 7.97 (Initial DTW + (Water Col. – 80% Recovery Water Col.)

7.01 + (4.81 - 3.85) = 7.01 + .96 = 7.97

Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate

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)

SAMPLING DATA

Odor: _____ Color: _____

Sample Designation: _____ Time / Date: _____

QC Sample Designation: _____ Time / Date: _____

QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Whale Pump/Bladder Pump / Other: _____

Sampling Method: Whale Pump/Bladder Pump / Other: _____

Remarks: _____

Sampling Personnel: _____

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: 32-1-17604-4 Location: 591 West 67th AVE Weather: 14° overcast

Concern: _____ Well No.: B6MW

Develop Date: 1/11/2018 Time Started: 1340 Time Completed: _____

PURGING DATA

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

Time of Depth Measurement: 11:04

Diameter of Casing: 1" ☐ 2" ☑

Total Depth of Well Below MP:	11.56	
Depth-to-Water (DTW) Below MP:	7.03	
Water Column in Well:	4.53	(Total Depth of Well Below MP - DTW Below MP)
Gallons per foot:	0.16	
Gallons in Well:	0.73	(Water Column in Well x Gallons per foot)
Three Well Volumes:	2.18	(Gallons in Well x 3)
Gallons Purged:	3.0	

80% of Well = 7.93'

DEVELOPMENT DATA

Odor: _____ Color: _____

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
1350	3.0	2.77	38	6.13	34.1	1000
1530	→ checked	DTW	→ 8.70	→ Not	80% recovered	

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	5 (1345-1350)	3	4 - Well Purged Dry
2			
3			
4			
5			
6			

Evacuation Method: Proactive Pump / Other: miniwhale Surge Block: PVC Surge Blocks

Remarks: _____

Sampling Personnel: ADV

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WELL PURGED DRY LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-4 Location: 59/W 67th Ave Weather: 14° overcast

Concern: _____ Well No.: B6MW

Date: 1/11/2018 Time Started: — Time Completed: —

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 11:04 Date of Depth Measurement: Top of PVC

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

Diameter of Casing: 2 in Well Screen Interval: _____

Total Depth of Well Below MP: 11.56 Product Thickness, if noted: _____

Depth-to-Water (DTW) Below MP: 7.03

Water Column in Well: 4.53 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 0.73 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 1/11/2018 Time Started: _____ Time Completed: _____

80% Recovery Water Column: 4.53 (0.80) = 3.624 (Water Column in Well x 0.8)

80% Recovery DTW: 7.93 (Initial DTW + (Water Col. – 80% Recovery Water Col.)

7.03 + (4.53 - 3.624) = 7.03 + 0.906 = 7.93

Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate

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)

SAMPLING DATA

Odor: _____ Color: _____

Sample Designation: _____ Time / Date: _____

QC Sample Designation: _____ Time / Date: _____

QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Whale Pump/Bladder Pump / Other: _____

Sampling Method: Whale Pump/Bladder Pump / Other: _____

Remarks: _____

Sampling Personnel: _____

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

FIELD ACTIVITIES DAILY LOG

Date 5/4/2018
Sheet 1 of 1
Project No. 32-1-17604-004

Project Name: Warning Lights DTW
Field activity subject: DTW + TD only
Description of daily activities and events:

10:15 MOB @ Shannon + Wilson office

11:00 on-site @ Warning Lights
Checked in w/ counter

11:05 B1 MW
DTW 5.09 IWV = 1.30
TD 13.25
No cap on PVC - needs to get "dug" out next sampling event - PVC needs to be cut in order to screw down

11:15 B3MW
DTW 4.30 IWV = 1.41
TD 13.15
Needs to cap - small one - PVC could be cut to fit

11:25 B2MW
DTW 4.89 IWV = 1.33
TD 13.20
Well in good condition

11:35 B6MW
DTW 4.33 IWV = 1.16
TD 11.57
Well in good condition / Bring smaller plug or PVC needs to be cut

11:50 B5MW
DTW 1.76 Well in good condition.
TD 11.85
IWV = 1.61

Visitors on site:

Changes from plans/specifications and other special orders and important decisions:

Weather conditions: Rainy + 40°F

Important telephone calls:

Personnel on site: ADV
Signature: Alena Vogt Date: 5/4/208

12:00 off-site DEMOB @ Shannon + Wilson office

FIELD ACTIVITIES DAILY LOG

Date 5/21/2013
Sheet 1 of 2
Project No. 32-1-17604-004

Project Name: Warning Lights 591 W. 67th AVE
Field activity subject: Well Development + Sampling
Description of daily activities and events:

10:00 On-Site
calibrated YSI + turbidimeter

10:25 Set up @ B5MW for Development
See Well development Log for details

13:37 Set up @ B6MW for Development
See Well development log for details

17:00 cleaning up heading back to STW

17:15 DEMOB @ STW office

Visitors on site:

Changes from plans/specifications and other special orders and important decisions:

Weather conditions:

Important telephone calls:

Personnel on site:
Signature: Date: 5/21/2013

FIELD ACTIVITIES DAILY LOG

Date 5/22/2018
Sheet 2 of 2
Project No. 32-1-17604-004

Project Name: Warning Lights
Field activity subject:
Description of daily activities and events:

1000 on-Site
1020 Sample time B5MW
1050 Sample time B6MW * Cut .15 ft off PVC
1120 Set up on B2MW
80% Well Volume of B2MW
9.50 X 0.8 = 7.6
3.70 + (9.50 - 7.6)
3.70 + 1.9 = 5.6
Sample time 12:45
Dup sample time 13:00

13:05 Set up on B1MW * Cut .10 off PVC
80% Well Volume of B1MW
8.91 x 0.8 = 7.12
4.34 + (8.91 - 7.12)
4.34 + 1.79 = 6.13
Sample time 14:15

1435 Set up on B3MW
80% Well Volume of B3MW
9.8 x 0.8 = 7.84
3.56 + (9.8 - 7.84) = 5.52
Sample time 15:55

16:35 cleaning up & reading back to S&W

* Calibration for 5/22/18 on B5MW Field Notes

Visitors on site:

Changes from plans/specifications and other special orders and important decisions:

Weather conditions:

Important telephone calls:

Personnel on site: ADV
Signature: Alexa Vood Date: 5/22/18

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-004 Location: 591 W 67th AVE Weather: overcast 40°

Well No.: BIMW

Date: 5/21/2018 Time Started: 13:05 Time Completed: 1430

Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 9:45 Date of Depth Measurement: 5/21/2018

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

Diameter of Casing: 2 inch Well Screen Interval: —

Total Depth of Well Below MP: 13.25 Product Thickness, if noted: —

Depth-to-Water (DTW) Below MP: 4.19 / ~~4.34~~ ADV

Water Column in Well: 8.91 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 1.43 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 5/22/2018 Time Started: 13:09 Time Completed: 1420

Three Well Volumes: 4.27 (Gallons in Well x 3)

Gallons Purged: 1.5 Depth of Pump (generally 2 ft from bottom): 5.34

Max. Drawdown (generally 0.3 ft): 1.17 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)
13:10	0.1	0.1	4.65	0.31	6.27	153	6.44	6.50	44.8	21.92
13:15	0.2	0.1	4.75	0.41	4.19	164	4.71	6.93	105.2	32.80
13:20	0.3	0.1	5.07	0.73	5.41	164	3.58	5.35	114.5	31.96
13:25	0.5	0.1	5.10	0.76	6.75	162	3.49	5.46	108.8	28.14
13:30	0.7	0.1	5.15	0.81	7.27	158	3.51	5.58	105.0	21.08
13:40	0.8	0.1	5.21	0.87	7.12	156	3.70	5.66	95.3	20.76

(DTW header: 4.34)

SAMPLING DATA

Odor: None Noted Color: clear

Sample Designation: 17604-BIMW Time / Date: 1415 5/22/2018

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

Calibration Info (Time, Ranges, etc)

Remarks:

Sampling Personnel: ~~ADV~~

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 80% = 6.13

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Continued from previous page

Job No: 32-1-17604-004 Location: 591 W 67th AVE Site: Warming Lights of Alaska Inc
Well No.: B1MW
Date: 5/22/2018

1hour 14:10

4.34

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)
13:45	0.9	0.1	5.28	0.94	6.78	146	3.51	5.68	82.2	15.85
13:50	1.0	0.1	5.34	1.00	8.39	141	3.06	5.67	98.4	28.83
1355	1.2	0.1	5.39	1.00	8.70	139	3.12	5.72	95.6	22.21
1400	1.3	0.1	5.43	1.09	9.91	135	3.14	5.82	86.9	26.72
1405	1.4	0.1	5.48	1.14	8.13	133	3.76	6.04	73.5	21.31
1410	1.5	0.1	5.51	1.17	8.02	131	3.58	6.03	74.1	21.06
1415	Sample time									

* Drawdown + parameters did not stabilize; 1 hour + 1 well volume + 80% water column befor sampling achieved

	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.

80% of Well 6.13

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-004 Location: 591 W 67th AVE Weather: overcast 40°

Well No.: B2MW

Date: 5/21/2018 Time Started: 11:20 Time Completed: 13:00

Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 10:00 Date of Depth Measurement: 5/21/2018

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

Diameter of Casing: 2inch Well Screen Interval: _____

5/22/18 DTW@ 1130 3.70

Total Depth of Well Below MP: 3.45/3.70 5/22/18 ADV Product Thickness, if noted: _____

Depth-to-Water (DTW) Below MP: 13.20

Water Column in Well: 9.50 (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)

PURGING DATA

Date Purged: 5/22/2018 Time Started: 11:40 Time Completed: 12:55

Three Well Volumes: 4.56 (Gallons in Well x 3)

Gallons Purged: 1.6 Depth of Pump (generally 2 ft from bottom): 4.70

Max. Drawdown (generally 0.3 ft): 0.38 Pump Rate: 0.1L/MIN

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)
11:40	0.1	0.1	3.75	0.05	4.24	394	2.33	6.27	103.8	8.23
11:45	0.2	0.1	3.77	0.07	3.60	389	1.40	5.16	132.4	9.37
11:50	0.3	0.1	3.79	0.09	4.65	393	1.16	5.07	130.6	6.02
11:55	0.4	0.1	3.83	0.13	3.95	411	0.91	5.10	126.8	5.36
12:00	0.5	0.1	3.86	0.16	4.21	419	0.73	5.00	131.3	5.52
12:05	0.6	0.1	3.90	0.20	3.84	429	0.72	5.09	130.4	2.81

SAMPLING DATA

Odor: None Noted Color: Clear

Sample Designation: 17604-B2MW Time / Date: 12:45 / 5/22/2018

QC Sample Designation: 17604-B4MW Time / Date: 13:00 / 5/22/2018

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 _____

Calibration Info (Time, Ranges, etc) _____

Remarks: _____

Sampling Personnel: ADV

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.

Continued from previous page

Job No: 32-1-17604 Location: 591 W 67th AVE Site: Warming Lights of Alaska Inc.

Well No.: B2MW

Date: 5/22/2018

1 hour @ 12:40

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)
12:10	0.8	0.1	3.93	0.23	3.75	440	0.60	5.18	122.8	0.92
12:15	1.0	0.1	3.95	0.25	4.01	440	0.57	5.14	122.4	3.15
12:20	1.1	0.1	3.97	0.27	4.19	444	0.56	5.46	99.3	2.09
12:25	1.3	0.1	4.00	0.30	3.30	445	0.51	5.49	96.1	1.92
12:30	1.4	0.1	4.02	0.32	2.84	443	0.49	5.33	106.8	1.84
12:35	1.5	0.1	4.05	0.35	3.09	437	0.45	5.10	109.1	2.33
12:40	1.6	0.1	4.08	0.38	3.35	434	0.42	4.97	114.0	3.86
12:45	Sample time									
13:00	Dup Sample time									

*Note Drawdown + parameters did not stabilize; 1 hour + 1 well volume + 80% water column before sampling achieved

	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.

80% 5.6

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-004 Location: 591 W 67th AVE Weather: Overcast 40°

Well No.: B3MW

Date: 5/21/2018 Time Started: 14:35 Time Completed: 16:25

Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 9:50 Date of Depth Measurement: 5/21/2018

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

Diameter of Casing: 2inch Well Screen Interval: —

Total Depth of Well Below MP: 3.35 / 3.56 ADV Product Thickness, if noted: —

Depth-to-Water (DTW) Below MP: 13.15

Water Column in Well: 9.8 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 1.56 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 5/22/2018 Time Started: 1443 Time Completed: 16:05

Three Well Volumes: 4.68 (Gallons in Well x 3)

Gallons Purged: 1.6 Depth of Pump (generally 2 ft from bottom): 14.56

Max. Drawdown (generally 0.3 ft): _____ Pump Rate: 0.1L/MIN

Well Purged Dry: Yes ☐ No ☑ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP): 3.56	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1445	0.1	0.1	3.96	0.40	7.48	847	2.23	6.30	53.1	20.39
1450	0.2	0.1	4.03	0.47	7.74	838	1.44	5.51	112.6	26.88
1455	0.3	0.1	4.10	0.54	7.28	872	0.80	5.06	135.9	36.57
1500	0.4	0.1	4.12	0.56	7.85	865	0.70	4.90	146.5	31.72
1505	0.5	0.1	4.20	0.64	9.92	882	0.62	5.78	71.5	30.86
1510	0.6	0.1	4.25	0.69	8.03	898	0.56	6.12	45.1	

SAMPLING DATA

Odor: None noted Color: Clear

Sample Designation: 17604-B3MW Time / Date: 15:55 / 5/22/2018

QC Sample Designation: — Time / Date: —

QA Sample Designation: — Time / Date: —

Evacuation Method: Submersible Pump / Other: miniWhale

Sampling Method: Submersible Pump / Other: miniwhale

Water Quality Instruments Used/Manufacturer/Model Number YSI, Turbidimeter, WLI

Calibration Info (Time, Ranges, etc) See Field Activities Log

Remarks: _____

Sampling Personnel: ADV

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

80% 5.52

LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Continued from previous page

Job No: 32-1-17604-004 Location: 591 W 67th AVE Site: WLA

Well No.: BBMW

Date: 5/22/2018

1hour @ 1545 80% well 5.52

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP): (3.50)	Drawdown (ft):	Temp: (°C)	Sp. Cond (uS/cm)	DO (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
15:15	0.8	0.1	4.29	0.73	6.62	902	0.52	5.68	59.9	20.57
15:25	0.9	0.1	4.35	0.78	6.69	906	0.38	5.23	75.0	14.66
15 30	1.0	0.1	4.38	0.82	7.04	903	0.33	5.13	86.0	12.65
15 35	1.2	0.1	4.41	0.85	7.73	906	0.36	5.19	86.3	9.53
15 40	1.3	0.1	4.44	0.88	8.46	905	0.35	5.45	70.1	12.73
1545	1.4	0.1	4.50	0.94	8.61	905	0.35	5.61	66.0	7.15
1550	1.6	0.1	4.52	0.96	6.84	911	0.36	5.86	43.3	6.20
1555	Sample time									
*	Drawdown + Parameters did not Stabilized; 1 hour + 1 well Volume + 80% water Column befor sampling achieved									

	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.

WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-004 Location: 591 W 67th AVE Weather: Overcast 40°

Concern: _____ Well No.: B5MW

Develop Date: 5/21/2018 Time Started: 10:25 Time Completed: 5/21/2018 13:35

PURGING DATA

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

Time of Depth Measurement: 10:20

Diameter of Casing: 1" ☐ 2" ☑

Total Depth of Well Below MP:	11.85	
Depth-to-Water (DTW) Below MP:	2.63	
Water Column in Well:	9.22	(Total Depth of Well Below MP - DTW Below MP)
Gallons per foot:	0.16	
Gallons in Well:	1.47	(Water Column in Well x Gallons per foot)
Three Well Volumes:	4.42	(Gallons in Well x 3)
Gallons Purged:	29.5	

DEVELOPMENT DATA

Odor: NA Color: Clear

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
10:40	1.5	3.49	.379	4.27	169.1	869.2
10:50	+2.0	5.47	.397	5.70	118.8	901.3
11:00	+2.0	4.16	.383	6.16	104.3	776.6
11:10	+2.0	3.88	.375	5.97	117.8	493.3
11:20	+3.0	3.15	.323	6.35	104.8	250.1
11:30	+3.5	2.29	.355	6.25	113.4	270.4
Well Purged Dry - Waiting for well to recharge						
11:45	DTW @	8.35				
12:15	DTW @	3.00				

	Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
40	1	10:30 - 10:35 5min	1.5	Time ~ 5min
50	2	10:40 - 10:45 5min	+ 2.0	5min
11	3	5min	+ 2.0	5min
10	4	5min	+ 2.0	5min
20	5	5min	+ 3.0	5min
30	6	5min	+ 3.5	5min

Evacuation Method: Proactive Pump / Other: mini whale Surge Block: White PVC

Remarks: 11:30 Well purged dry → DTW 10.35 →

Sampling Personnel: ADV

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

3 hours effort @ 13:30

WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-004 Location: 591 W. 67th AVE Weather: Overcast 40°

Concern: _____ Well No.: B5MW

Date: 5/21/2018 Time Started: 10:30 Time Completed: 13:35

DEVELOPMENT DATA CONTINUED

+14 gallons

	Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
18	12:20	+4	5.49	.398	7.31	81.2	812.0
	Surging 5 min						
22	12:30	+4	3.68	.379	7.09	92.2	716.1
	Surging 5 min						
23.5	12:40	+1.5	2.42	.364	7.22	94.3	832.6
	Well Purged dry @ 12:40 ; wait for recharge						
	DTW @ 10.70						
	12:55 DTW @ 6.63						
	13:00 DTW @ 5.13						
	13:05 DTW @ 4.47						
	Surging 5 min						
27.5	13:10	+4	4.61	.388	7.74	82.4	631.7
	Surging 5min						
29.5	13:20	+2	2.93	.374	7.01	105.4	355.0
	Well Purged dry @ 13:20						
	DTW @ 10.30						
	13:30 DTW @ 8.85						
	3 hours of effort ; no stabilization or 55 gallons						
	Will wait for well to at least be @ 80% to sample						
	5/22/2018 10:00 DTW @ 2.68 - below Top of Screen ✓						
	10:05 Calibrated YSI, Turbidimeter						
	10:20 Sample taken						
	Parameters of sample		5.85	.429	5.17	174.1	9.68

Well @ 80% 4.48

Screen 2-12

Remarks: _____

Sampling Personnel: ADV

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: 32-1-17604-004 Location: 591 W 67th AVE Weather: Overcast 40°

Concern: _____ Well No.: B6MW

Develop Date: 5/21/2018 Time Started: 13:37 Time Completed: 16:55

PURGING DATA

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

Time of Depth Measurement: 10:10

Diameter of Casing: 1" ☐ 2" ☑

13:38 Total Depth of Well Below MP: 11.57

3.50 Depth-to-Water (DTW) Below MP: 3.44

Water Column in Well: 8.13 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 1.30 (Water Column in Well x Gallons per foot)

Three Well Volumes: 3.90 (Gallons in Well x 3)

Gallons Purged: 0.0

DEVELOPMENT DATA

Odor: _____ Color: _____

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
13:50	4	1.10	.145	6.84	90.6	133.2
14:00	+ 2	3.10	.172	5.69	122.8	138.3
Well Purged dry DTW@ 10.20, Wait for recharge to 80%						
80% well 5.07						
14:15	DTW@	8.77				
14:30	DTW@	8.17				
14:45	DTW@	7.70				
15:00	DTW@	7.30				
15:15	DTW@	6.98				

Surging	Surging Time (minutes)	Gallons Purged	Purging Time (minutes)
1	13:40-45 (5)	4	5min
2	5	2	5
3			
4			
5			
6			

Evacuation Method: Proactive Pump / Other: mini whale Surge Block: PVC Block

Remarks: _____

Sampling Personnel: ADV

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: 32-1-17604-004 Location: 591 W 67th AVE Weather: overcast 40°

Concern: _____ Well No.: B6MW

Date: 5/21/2018 Time Started: _____ Time Completed: _____

DEVELOPMENT DATA CONTINUED

16:40
3 hour effort
80% 5.07

Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)
15:30	DTW@	6.57				
15:45	DTW@	6.30				
16:00	DTW@	6.15				
16:15	DTW@	5.85				
16:20	3.25	2.51	.150	6.52	99.9	51.83
Well	Purged dry again		DTW@		1023	
16:30	DTW	9.62				
16:45	DTW	9.30				
5/22/2018		10:35	DTW @ 3.70 → below Top of Screen			Screen 2-12
		4.14	.171	6.72	116.1	18.41
10:50	sample time					

Remarks: _____

Sampling Personnel: _____

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

WELL PURGED DRY LOG

Shannon & Wilson, Inc.

Job No: 32-1-17604-004 Location: 591 W 67th AVE Weather: Overcast 40°

Concern: _____ Well No.: B6MW

Date: 5/21/2018 Time Started: — Time Completed: —

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 10:10 Date of Depth Measurement: 5/21/2018

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

Diameter of Casing: 2inch Well Screen Interval: —

Total Depth of Well Below MP: 11.57 Product Thickness, if noted: —

Depth-to-Water (DTW) Below MP: 3.44

Water Column in Well: 8.13 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.6

Gallons in Well: 3.90 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 5/21/18 Time Started: _____ Time Completed: _____

80% Recovery Water Column: 8.13x0.8 = 6.50 (Water Column in Well x 0.8)

80% Recovery DTW: 5.07 (Initial DTW + (Water Col. – 80% Recovery Water Col.)

3.44 + (8.13 - 6.50)

3.44 + 1.63 = 5.07

Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate

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)

SAMPLING DATA

Odor: _____ Color: _____

Sample Designation: _____ Time / Date: _____

QC Sample Designation: _____ Time / Date: _____

QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Whale Pump/Bladder Pump / Other: _____

Sampling Method: Whale Pump/Bladder Pump / Other: _____

Remarks: _____

Sampling Personnel: _____

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

FIELD ACTIVITIES DAILY LOG

Date 6/8/18
Sheet 1 of
Project No. 32-1-17604-004

Project Name: 591 W 67th Avenue; Warning Lights
Field activity subject: Level Loop Survey
Description of daily activities and events:

B1MW TOC - GS = .14 DTW = 4.13 (10:20)

B2MW TOC - GS = .16 DTW = 3.69 (10:18)

B3MW TOC - GS = .28 DTW = 3.36 (10:24)
Cut PVC down .17'

B5MW TOC - GS = .40 DTW = 3.22 (10:10)

B6MW TOC - GS = .21 DTW = 3.58 (10:14)

13.26
13.25

Visitors on site:

Changes from plans/specifications and other special orders and important decisions:

Weather conditions:

Important telephone calls:

Personnel on site:

Signature: Date:

Table 1
Differential Leveling Survey Field Log Sheet and Instructions

SHANNON & WILSON, INC.

32-1-17604-004 WARNING LIGHTS JCT + ADV

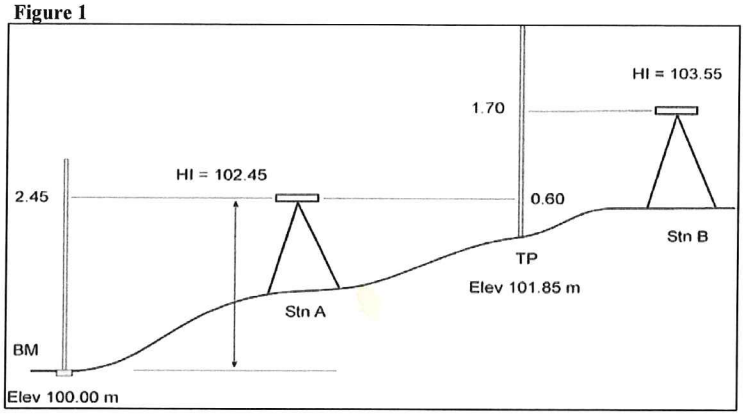
Station or Survey Point ID	Backsight (BS) (+)	Height of Instrument (HI)	Foresight (FS) (-)	Elevation	Comments
TBM	3.57	103.57		100.00	TBM Temporary benchmark with elevation of 100.00'
B1MW			5.12	98.45	
B3MW			5.54	98.03	
TP1	4.55	102.53	5.54	97.98	
B2MW			5.00	97.53	
B6MW			5.15	97.38	
B5MW			5.65	96.88	
TP2	5.14	103.1	4.57	97.96	
TBM			3.09	100.01	Final shot back on TBM to close the Loop.
Sum of TBM & TP FS and BS	13.26		13.25		

Example of Completed Survey

Station or Survey Point ID	Backsight BS (+)	Height of Instrument (HI)	Foresight (FS) (-)	Elevation	Comments
TBM	5.20	1422.04		1416.84	Temporary benchmark w elevation of 1416.84 feet
MW-5			1.40	1420.64	Monitoring well 5
MW-21			3.44	1418.60	
TP1	5.26	1421.46	5.84	1416.20	Instrument moved to new location
MW-23			2.72	1418.74	
MW-24			2.51	1418.95	
MW-22			4.48	1416.98	
MW-8			5.43	1416.03	
TP2	5.52	1421.81	5.17	1416.29	New instrument location to shoot back to TBM
TBM			4.98	1416.83	Final shot back on TBM to close the loop.
Sum of	15.98		15.99		**The Sum of the BS for the TBM and TPs should be within 0.01 of the Sum of the FS for the TBM and TP readings. The difference between these sums will also be equal to the difference between the original TBM and final TBM elevation.**

Figure 1 below shows an example of a traverse with one turning point. The traverse carries an elevation from a known benchmark (BM) to the top of a hill. From the first set-up (Stn A), a BS reading is taken to the BM (Elev. = 100.00). Suppose the rod reading is 2.45 meters: the HI @ Stn A is therefore 100.00 + 2.45= 102.45 m. Suppose you then take a FS to another point, and read 0.60 on the rod; the elevation of that point is HI-FS = 102.45-0.60 = 101.85 meters. If you move the instrument, you use that point to turn on, i.e. you move to the top of the hill and take a BS to the rod. The new HI is 101.85 + 1.70 = 103.55.

Figure 1

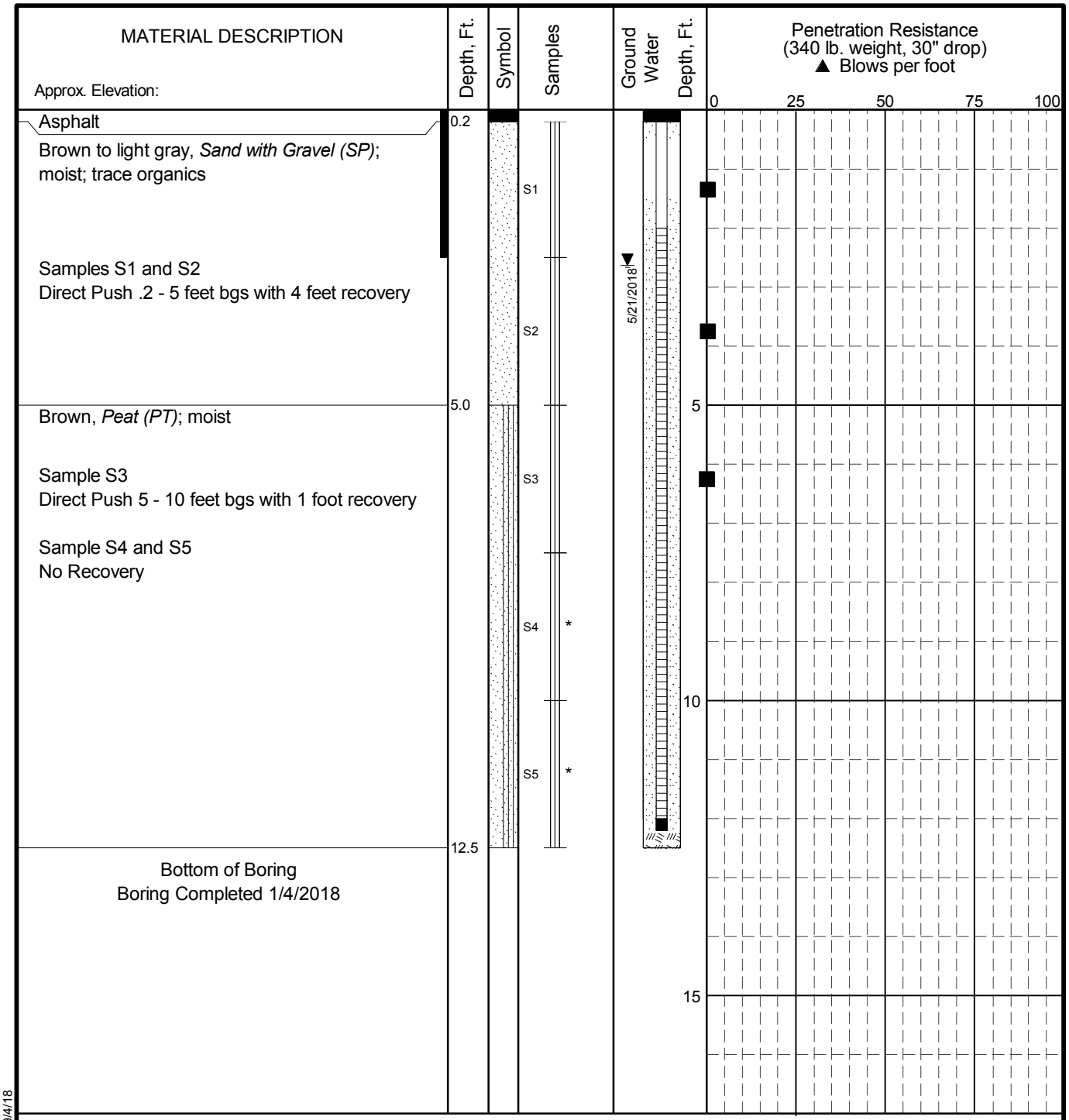


Instructions for Completing a Survey

* Make sure you have a site map
* An accurate survey must have two turning points.
* When tying in new wells to an existing survey, the TBM should not be a well and the survey must have at least one turning point.
* For small sites with few measuring points, the site should be resurveyed rather than tying in one or two additional wells (discuss with PM and cofirm time is available in budget).
* For large sites with many measuring points, covering a large area, additional wells should be tied in to existing survey.

APPENDIX C

BORING LOGS AND MONITORING WELL CONSTRUCTION DETAILS



LEGEND

* Sample not recovered

3" O.D. Split Spoon Sample

Frozen

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 B5

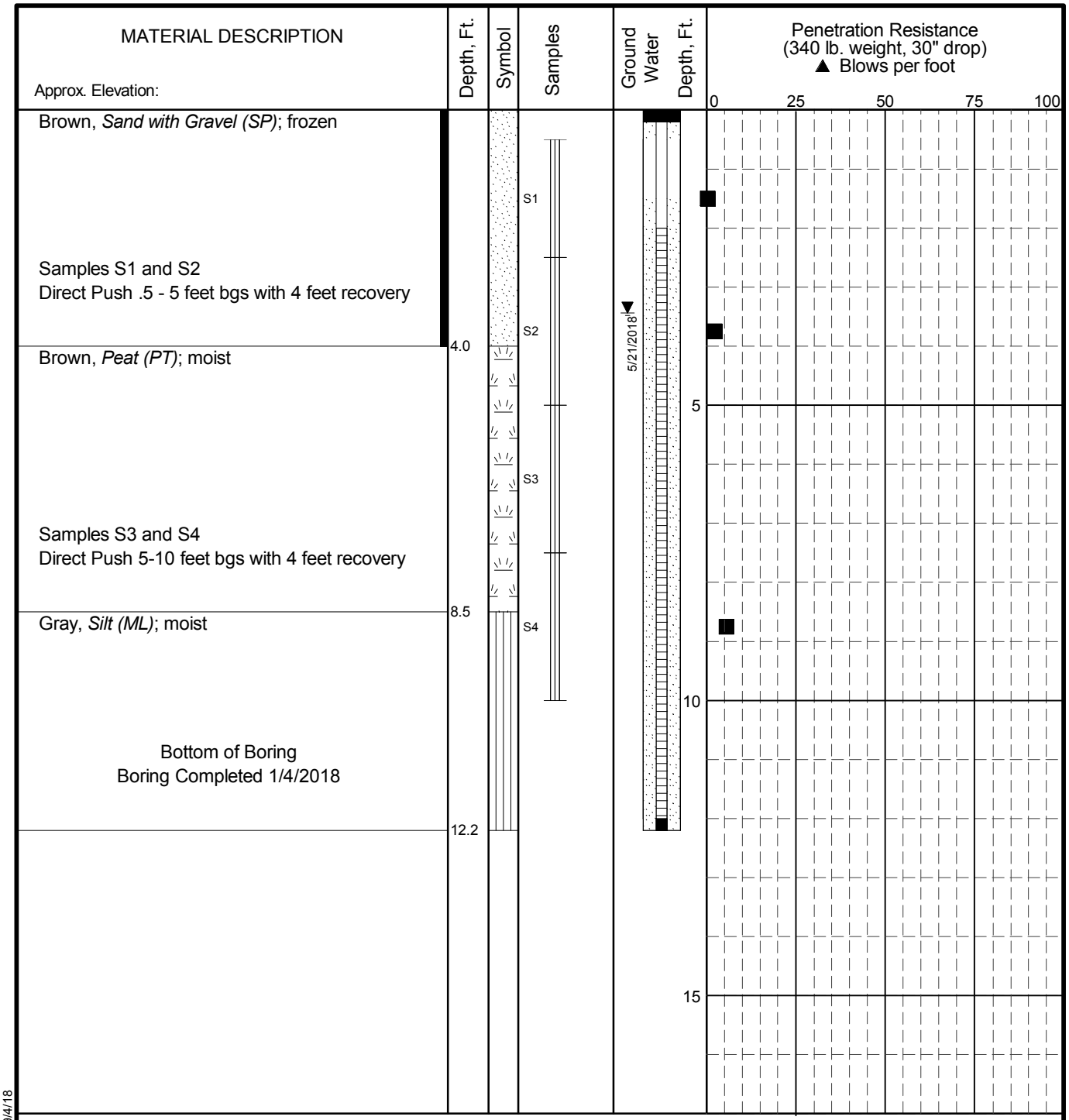
August 2018

32-1-17604-004

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. C-1

ENVIRONMENTAL LOG BORING LOGS.GPJ S&W_GEO1.GDT 9/4/18



LEGEND

* Sample not recovered

3" O.D. Split Spoon Sample

Frozen

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 B6

August 2018 32-1-17604-004

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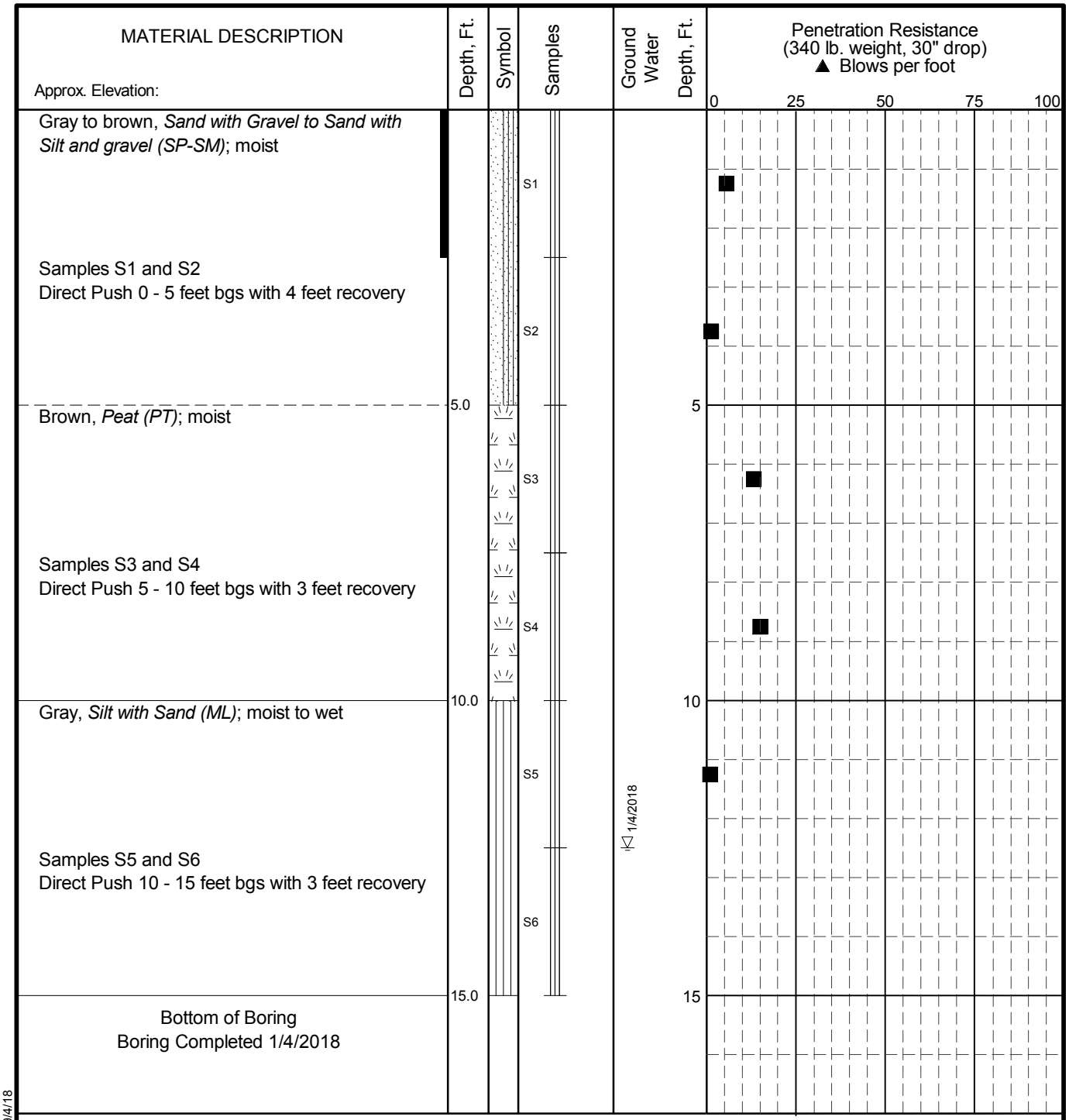
FIG. C-2

ENVIRONMENTAL LOG BORING LOGS.GPJ S&W_GEO1.GDT 9/4/18



LEGEND

* Sample not recovered

3" O.D. Split Spoon Sample

Ground Water Level At Time Of Drilling

Frozen

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 B7

August 2018

32-1-17604-004

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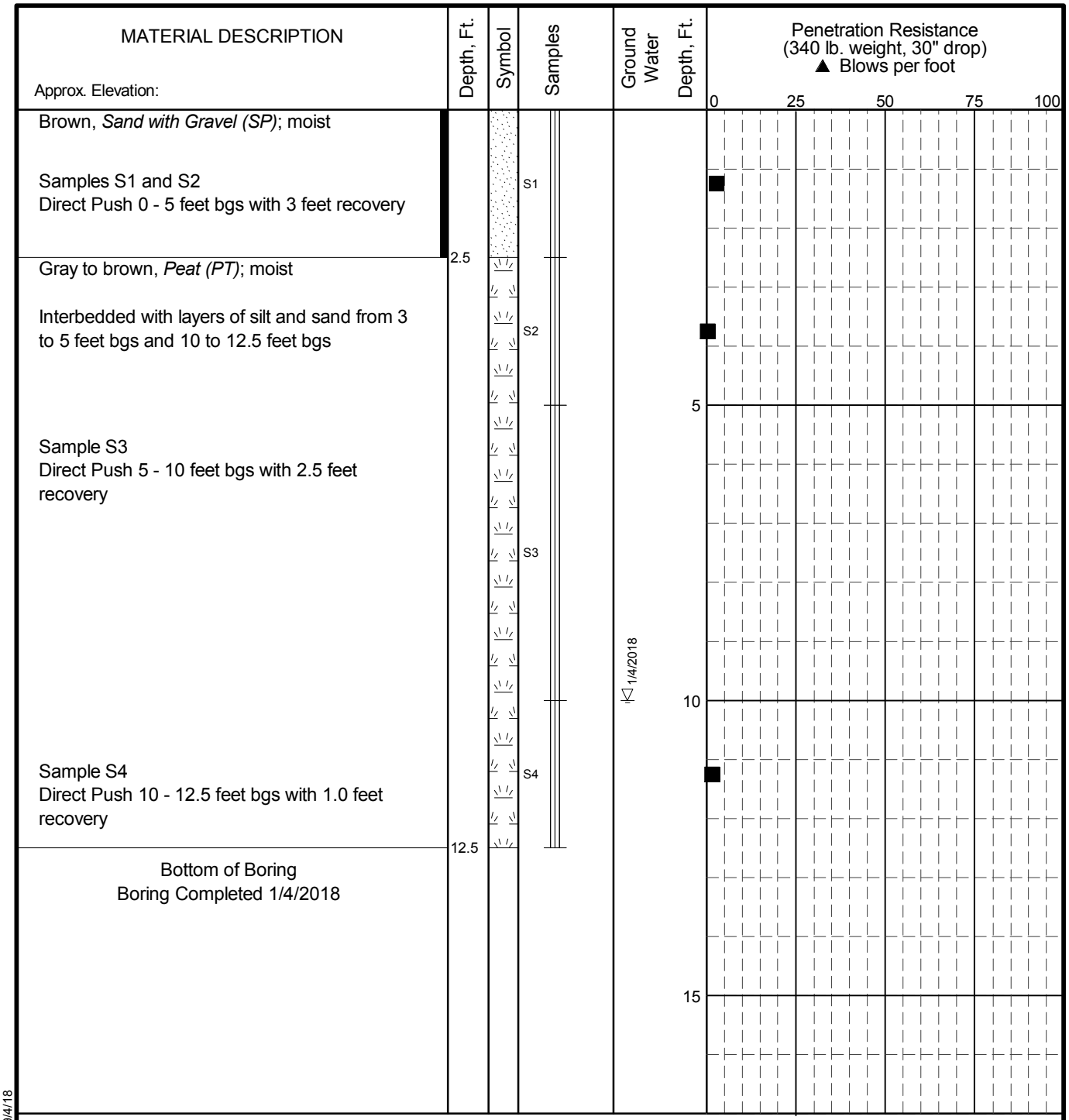
FIG. C-3

ENVIRONMENTAL LOG BORING LOGS.GPJ S&W_GEO1.GDT 9/4/18



LEGEND

* Sample not recovered

3" O.D. Split Spoon Sample

Ground Water Level At Time Of Drilling

Frozen

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 B8

August 2018

32-1-17604-004

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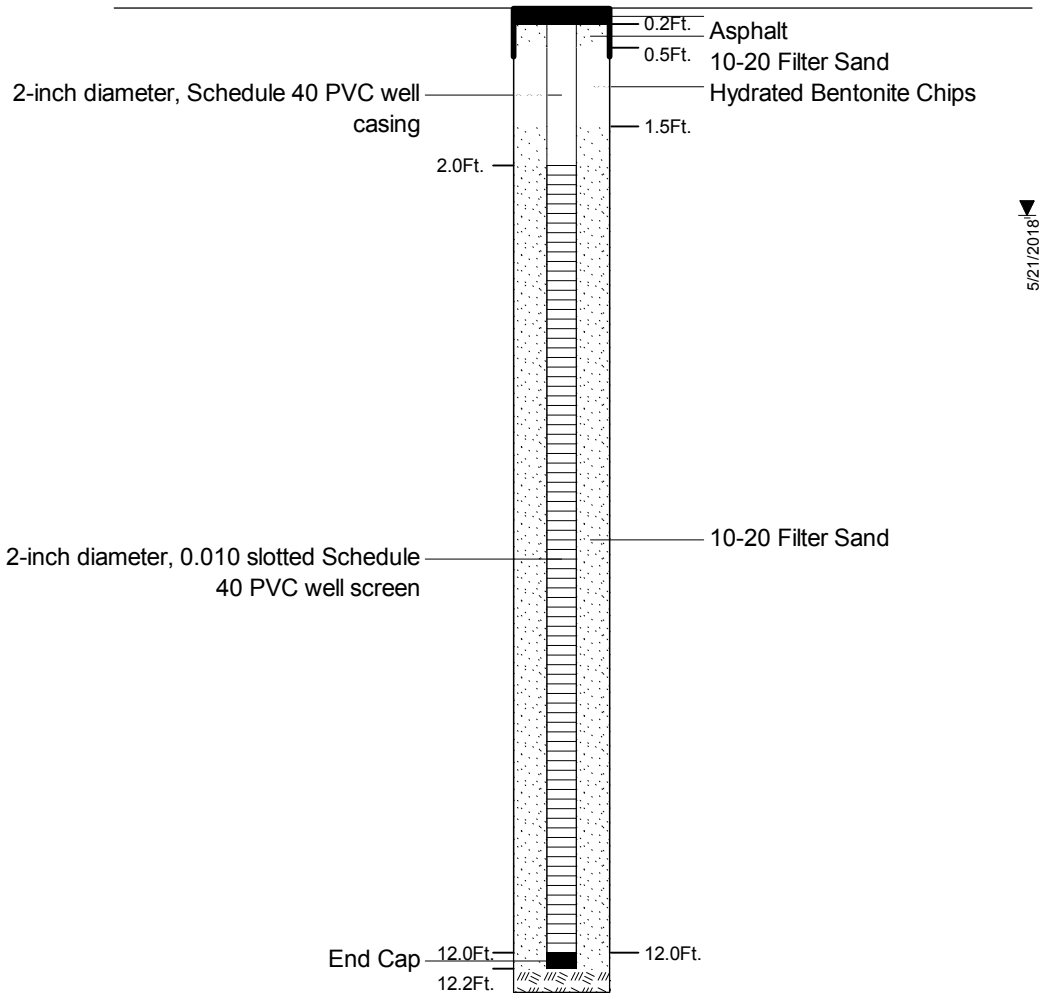
FIG. C-4

ENVIRONMENTAL LOG BORING LOGS.GPJ S&W_GEO1.GDT 9/4/18

Casing Description | **Backfill Description**



LEGEND

▽ Groundwater Level ATD

▼ Static Groundwater Level

NOTE: All joints use threaded connections.

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MONITORING WELL B5MW
CONSTRUCTION DETAIL

August 2018 32-1-17604-004

SHANNON & WILSON, INC.
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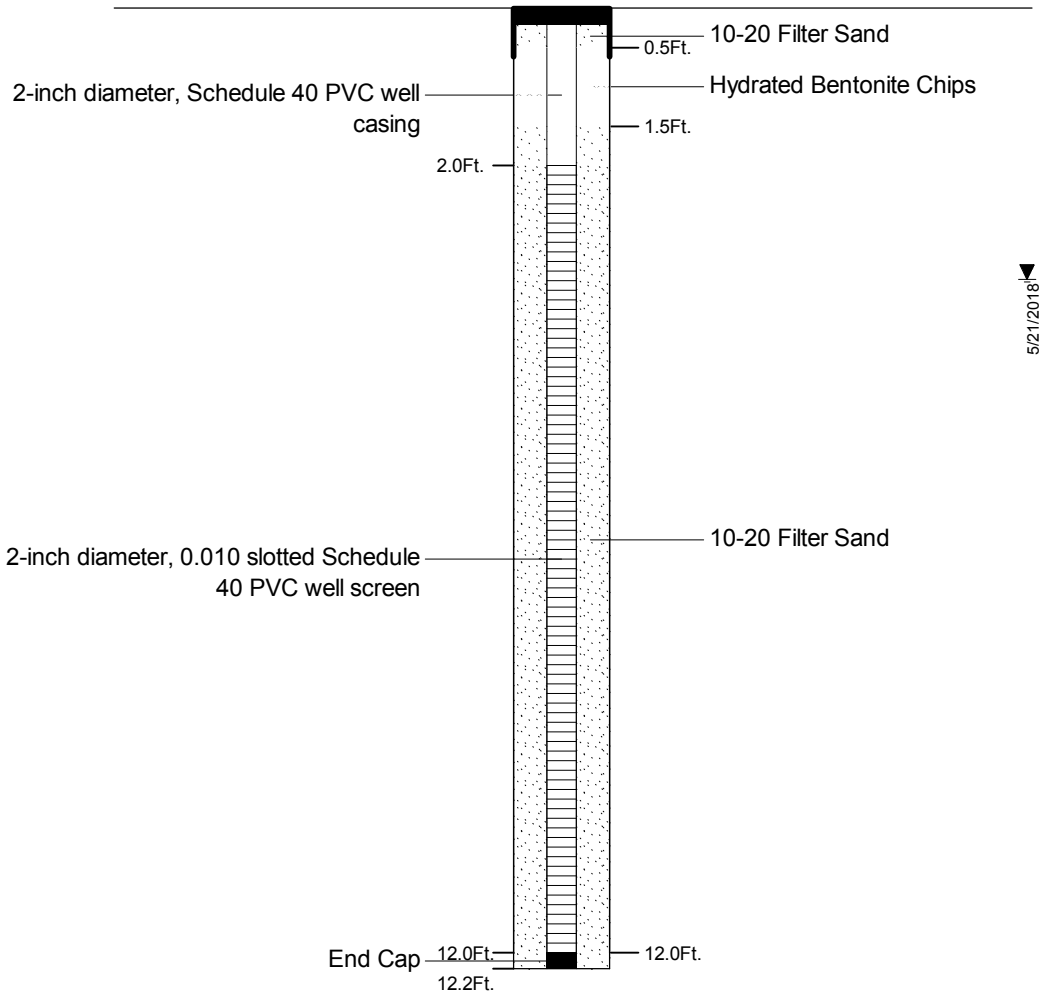
Fig. C-5

Casing Description **Backfill Description**



LEGEND

▽ Groundwater Level ATD

▼ Static Groundwater Level

NOTE: All joints use threaded connections.

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MONITORING WELL B6MW
CONSTRUCTION DETAIL

August 2018 32-1-17604-004

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Fig. C-6

APPENDIX D

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
907-561-2120

Report Number: **1180087**

Client Project: **32-1-17604-4 Warning Lights**

Dear Alena Voigt,

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 Jillian 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.

_____

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

Print Date: 01/16/2018 2:33:46PM

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1180087**
Project Name/Site: **32-1-17604-4 Warning Lights**
Project Contact: **Alena Voigt**

Refer to sample receipt form for information on sample condition.

180087001MSD (1431228) MSD

8260C - MSD RPD for vinyl acetate (23.9) 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.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1431575	1180115010MS	XMS10609	Benzo[g,h,i]perylene	RP
1431575	1180115010MS	XMS10609	Chrysene	RP
1431576	1180115010MSD	XMS10609	Benzo[g,h,i]perylene	RP
1431576	1180115010MSD	XMS10609	Chrysene	RP
1431576	1180115010MSD	XMS10609	Dibenzo[a,h]anthracene	RP
1431576	1180115010MSD	XMS10609	Indeno[1,2,3-c,d] pyrene	RP

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.

Print Date: 01/16/2018 2:33:48PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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, indenmification 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 (Provisionally Certified as of 10/12/2017) & Microbiology (Provisionally Certified as of 9/21/2017)** & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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	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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
17604-B5S3	1180087001	01/04/2018	01/05/2018	Soil/Solid (dry weight)
17604-B6S4	1180087002	01/04/2018	01/05/2018	Soil/Solid (dry weight)
17604-B7S5	1180087003	01/04/2018	01/05/2018	Soil/Solid (dry weight)
17604-B8S4	1180087004	01/04/2018	01/05/2018	Soil/Solid (dry weight)
17604-B5S23	1180087005	01/04/2018	01/05/2018	Soil/Solid (dry weight)
17604-BSTB CANCELLED	1180087006	01/04/2018	01/05/2018	Soil/Solid (dry weight)
17604-B7S4	1180087007	01/04/2018	01/05/2018	Soil/Solid (dry weight)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260C	VOC 8260 (S) Field Extracted

SGS North America Inc.
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Detectable Results Summary

Client Sample ID: **17604-B5S3**
Lab Sample ID: 1180087001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	18.6J	mg/Kg

Client Sample ID: **17604-B6S4**
Lab Sample ID: 1180087002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	8.26J	ug/Kg
	Phenanthrene	11.0J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	30.4	mg/Kg
Volatile GC/MS	Methyl-t-butyl ether	243	ug/Kg

Client Sample ID: **17604-B5S23**
Lab Sample ID: 1180087005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	29.9	mg/Kg

Client Sample ID: **17604-B7S4**
Lab Sample ID: 1180087007

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	534	mg/Kg

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **17604-B5S3**

Client Sample ID: **17604-B5S3**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087001
Lab Project ID: 1180087

Collection Date: 01/04/18 13:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):80.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	18.6	J	24.5	7.60	mg/Kg	1		01/15/18 19:20
Surrogates								
5a Androstane (surr)	80.8		50-150		%	1		01/15/18 19:20

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/15/18 19:20
Container ID: 1180087001-A

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 01/11/18 08:53
Prep Initial Wt./Vol.: 30.281 g
Prep Extract Vol: 1 mL

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B5S3**

Client Sample ID: **17604-B5S3**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087001
Lab Project ID: 1180087

Collection Date: 01/04/18 13:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):80.9
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	14.7	U	29.3	9.08	ug/Kg	1		01/08/18 23:14
1,1,1-Trichloroethane	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,1,2,2-Tetrachloroethane	9.15	U	18.3	5.71	ug/Kg	1		01/08/18 23:14
1,1,2-Trichloroethane	7.35	U	14.7	4.54	ug/Kg	1		01/08/18 23:14
1,1-Dichloroethane	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,1-Dichloroethene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,1-Dichloropropene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,2,3-Trichlorobenzene	36.6	U	73.3	22.0	ug/Kg	1		01/08/18 23:14
1,2,3-Trichloropropane	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,2,4-Trichlorobenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,2,4-Trimethylbenzene	36.6	U	73.3	22.0	ug/Kg	1		01/08/18 23:14
1,2-Dibromo-3-chloropropane	73.5	U	147	45.4	ug/Kg	1		01/08/18 23:14
1,2-Dibromoethane	7.35	U	14.7	4.54	ug/Kg	1		01/08/18 23:14
1,2-Dichlorobenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,2-Dichloroethane	7.35	U	14.7	4.54	ug/Kg	1		01/08/18 23:14
1,2-Dichloropropane	7.35	U	14.7	4.54	ug/Kg	1		01/08/18 23:14
1,3,5-Trimethylbenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,3-Dichlorobenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
1,3-Dichloropropane	7.35	U	14.7	4.54	ug/Kg	1		01/08/18 23:14
1,4-Dichlorobenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
2,2-Dichloropropane	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
2-Butanone (MEK)	183	U	366	114	ug/Kg	1		01/08/18 23:14
2-Chlorotoluene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
2-Hexanone	73.5	U	147	45.4	ug/Kg	1		01/08/18 23:14
4-Chlorotoluene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
4-Isopropyltoluene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
4-Methyl-2-pentanone (MIBK)	183	U	366	114	ug/Kg	1		01/08/18 23:14
Benzene	9.15	U	18.3	5.71	ug/Kg	1		01/08/18 23:14
Bromobenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
Bromochloromethane	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
Bromodichloromethane	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
Bromoform	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
Bromomethane	147	U	293	90.8	ug/Kg	1		01/08/18 23:14
Carbon disulfide	73.5	U	147	45.4	ug/Kg	1		01/08/18 23:14
Carbon tetrachloride	9.15	U	18.3	5.71	ug/Kg	1		01/08/18 23:14
Chlorobenzene	18.3	U	36.6	11.4	ug/Kg	1		01/08/18 23:14
Chloroethane	147	U	293	90.8	ug/Kg	1		01/08/18 23:14

Results of **17604-B5S3**

Client Sample ID: **17604-B5S3**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087001
Lab Project ID: 1180087

Collection Date: 01/04/18 13:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):80.9
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Chloromethane	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
cis-1,2-Dichloroethene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
cis-1,3-Dichloropropene	9.15 U		18.3	5.71	ug/Kg	1		01/08/18 23:14
Dibromochloromethane	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Dibromomethane	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Dichlorodifluoromethane	36.6 U		73.3	22.0	ug/Kg	1		01/08/18 23:14
Ethylbenzene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Freon-113	73.5 U		147	45.4	ug/Kg	1		01/08/18 23:14
Hexachlorobutadiene	14.7 U		29.3	9.08	ug/Kg	1		01/08/18 23:14
Isopropylbenzene (Cumene)	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Methylene chloride	73.5 U		147	45.4	ug/Kg	1		01/08/18 23:14
Methyl-t-butyl ether	73.5 U		147	45.4	ug/Kg	1		01/08/18 23:14
Naphthalene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
n-Butylbenzene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
n-Propylbenzene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
o-Xylene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
P & M -Xylene	36.6 U		73.3	22.0	ug/Kg	1		01/08/18 23:14
sec-Butylbenzene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Styrene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
tert-Butylbenzene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
Tetrachloroethene	9.15 U		18.3	5.71	ug/Kg	1		01/08/18 23:14
Toluene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
trans-1,2-Dichloroethene	18.3 U		36.6	11.4	ug/Kg	1		01/08/18 23:14
trans-1,3-Dichloropropene	9.15 U		18.3	5.71	ug/Kg	1		01/08/18 23:14
Trichloroethene	7.35 U		14.7	4.54	ug/Kg	1		01/08/18 23:14
Trichlorofluoromethane	36.6 U		73.3	22.0	ug/Kg	1		01/08/18 23:14
Vinyl acetate	73.5 U		147	45.4	ug/Kg	1		01/08/18 23:14
Vinyl chloride	7.35 U		14.7	4.54	ug/Kg	1		01/08/18 23:14
Xylenes (total)	55.0 U		110	33.4	ug/Kg	1		01/08/18 23:14
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		01/08/18 23:14
4-Bromofluorobenzene (surr)	68.4		55-151		%	1		01/08/18 23:14
Toluene-d8 (surr)	94.8		85-116		%	1		01/08/18 23:14

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J flagging is activated

Results of **17604-B5S3**

Client Sample ID: **17604-B5S3**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087001
Lab Project ID: 1180087

Collection Date: 01/04/18 13:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):80.9
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 01/08/18 23:14
Container ID: 1180087001-B

Prep Batch: VXX31862
Prep Method: SW5035A
Prep Date/Time: 01/04/18 13:10
Prep Initial Wt./Vol.: 62.346 g
Prep Extract Vol: 36.9308 mL

Results of **17604-B6S4**

Client Sample ID: **17604-B6S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087002
Lab Project ID: 1180087

Collection Date: 01/04/18 16:15
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):75.9
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	8.26	J	32.5	8.13	ug/Kg	1		01/12/18 17:48
2-Methylnaphthalene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Acenaphthene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Acenaphthylene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Anthracene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Benzo(a)Anthracene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Benzo[a]pyrene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Benzo[b]Fluoranthene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Benzo[g,h,i]perylene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Benzo[k]fluoranthene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Chrysene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Dibenzo[a,h]anthracene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Fluoranthene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Fluorene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Indeno[1,2,3-c,d] pyrene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Naphthalene	13.0	U	26.0	6.50	ug/Kg	1		01/12/18 17:48
Phenanthrene	11.0	J	32.5	8.13	ug/Kg	1		01/12/18 17:48
Pyrene	16.3	U	32.5	8.13	ug/Kg	1		01/12/18 17:48
Surrogates								
2-Methylnaphthalene-d10 (surr)	73.8		50-150		%	1		01/12/18 17:48
Fluoranthene-d10 (surr)	82.1		50-150		%	1		01/12/18 17:48

Batch Information

Analytical Batch: XMS10609
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 01/12/18 17:48
Container ID: 1180087002-A

Prep Batch: XXX38993
Prep Method: SW3550C
Prep Date/Time: 01/12/18 07:47
Prep Initial Wt./Vol.: 22.803 g
Prep Extract Vol: 5 mL

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B6S4**

Client Sample ID: **17604-B6S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087002
Lab Project ID: 1180087

Collection Date: 01/04/18 16:15
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):75.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	30.4		26.3	8.15	mg/Kg	1		01/15/18 19:29
Surrogates								
5a Androstane (surr)	72.4		50-150		%	1		01/15/18 19:29

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/15/18 19:29
Container ID: 1180087002-A

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 01/11/18 08:53
Prep Initial Wt./Vol.: 30.087 g
Prep Extract Vol: 1 mL

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B6S4**

Client Sample ID: **17604-B6S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087002
Lab Project ID: 1180087

Collection Date: 01/04/18 16:15
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):75.9
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	20.3	U	40.6	12.6	ug/Kg	1		01/08/18 23:31
1,1,1-Trichloroethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,1,2,2-Tetrachloroethane	12.7	U	25.4	7.91	ug/Kg	1		01/08/18 23:31
1,1,2-Trichloroethane	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
1,1-Dichloroethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,1-Dichloroethene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,1-Dichloropropene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,2,3-Trichlorobenzene	50.5	U	101	30.4	ug/Kg	1		01/08/18 23:31
1,2,3-Trichloropropane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,2,4-Trichlorobenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,2,4-Trimethylbenzene	50.5	U	101	30.4	ug/Kg	1		01/08/18 23:31
1,2-Dibromo-3-chloropropane	102	U	203	62.9	ug/Kg	1		01/08/18 23:31
1,2-Dibromoethane	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
1,2-Dichlorobenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,2-Dichloroethane	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
1,2-Dichloropropane	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
1,3,5-Trimethylbenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,3-Dichlorobenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
1,3-Dichloropropane	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
1,4-Dichlorobenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
2,2-Dichloropropane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
2-Butanone (MEK)	254	U	507	158	ug/Kg	1		01/08/18 23:31
2-Chlorotoluene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
2-Hexanone	102	U	203	62.9	ug/Kg	1		01/08/18 23:31
4-Chlorotoluene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
4-Isopropyltoluene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
4-Methyl-2-pentanone (MIBK)	254	U	507	158	ug/Kg	1		01/08/18 23:31
Benzene	12.7	U	25.4	7.91	ug/Kg	1		01/08/18 23:31
Bromobenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Bromochloromethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Bromodichloromethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Bromoform	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Bromomethane	203	U	406	126	ug/Kg	1		01/08/18 23:31
Carbon disulfide	102	U	203	62.9	ug/Kg	1		01/08/18 23:31
Carbon tetrachloride	12.7	U	25.4	7.91	ug/Kg	1		01/08/18 23:31
Chlorobenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Chloroethane	203	U	406	126	ug/Kg	1		01/08/18 23:31

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J flagging is activated

Results of **17604-B6S4**

Client Sample ID: **17604-B6S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087002
Lab Project ID: 1180087

Collection Date: 01/04/18 16:15
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):75.9
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Chloromethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
cis-1,2-Dichloroethene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
cis-1,3-Dichloropropene	12.7	U	25.4	7.91	ug/Kg	1		01/08/18 23:31
Dibromochloromethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Dibromomethane	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Dichlorodifluoromethane	50.5	U	101	30.4	ug/Kg	1		01/08/18 23:31
Ethylbenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Freon-113	102	U	203	62.9	ug/Kg	1		01/08/18 23:31
Hexachlorobutadiene	20.3	U	40.6	12.6	ug/Kg	1		01/08/18 23:31
Isopropylbenzene (Cumene)	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Methylene chloride	102	U	203	62.9	ug/Kg	1		01/08/18 23:31
Methyl-t-butyl ether	243		203	62.9	ug/Kg	1		01/08/18 23:31
Naphthalene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
n-Butylbenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
n-Propylbenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
o-Xylene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
P & M -Xylene	50.5	U	101	30.4	ug/Kg	1		01/08/18 23:31
sec-Butylbenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Styrene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
tert-Butylbenzene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
Tetrachloroethene	12.7	U	25.4	7.91	ug/Kg	1		01/08/18 23:31
Toluene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
trans-1,2-Dichloroethene	25.4	U	50.7	15.8	ug/Kg	1		01/08/18 23:31
trans-1,3-Dichloropropene	12.7	U	25.4	7.91	ug/Kg	1		01/08/18 23:31
Trichloroethene	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
Trichlorofluoromethane	50.5	U	101	30.4	ug/Kg	1		01/08/18 23:31
Vinyl acetate	102	U	203	62.9	ug/Kg	1		01/08/18 23:31
Vinyl chloride	10.2	U	20.3	6.29	ug/Kg	1		01/08/18 23:31
Xylenes (total)	76.0	U	152	46.3	ug/Kg	1		01/08/18 23:31
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		01/08/18 23:31
4-Bromofluorobenzene (surr)	58.9		55-151		%	1		01/08/18 23:31
Toluene-d8 (surr)	95.4		85-116		%	1		01/08/18 23:31

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B6S4**

Client Sample ID: **17604-B6S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087002
Lab Project ID: 1180087

Collection Date: 01/04/18 16:15
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):75.9
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 01/08/18 23:31
Container ID: 1180087002-B

Prep Batch: VXX31862
Prep Method: SW5035A
Prep Date/Time: 01/04/18 16:15
Prep Initial Wt./Vol.: 47.33 g
Prep Extract Vol: 36.4213 mL

Results of **17604-B7S5**

Client Sample ID: **17604-B7S5**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087003
Lab Project ID: 1180087

Collection Date: 01/04/18 11:45
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.3	U	22.6	7.00	mg/Kg	1		01/15/18 19:39
Surrogates								
5a Androstane (surr)	80.3		50-150		%	1		01/15/18 19:39

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/15/18 19:39
Container ID: 1180087003-A

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 01/11/18 08:53
Prep Initial Wt./Vol.: 30.082 g
Prep Extract Vol: 1 mL

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B7S5**

Client Sample ID: **17604-B7S5**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087003
Lab Project ID: 1180087

Collection Date: 01/04/18 11:45
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	11.8	U	23.6	7.32	ug/Kg	1		01/08/18 23:48
1,1,1-Trichloroethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,1,2,2-Tetrachloroethane	7.40	U	14.8	4.60	ug/Kg	1		01/08/18 23:48
1,1,2-Trichloroethane	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
1,1-Dichloroethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,1-Dichloroethene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,1-Dichloropropene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,2,3-Trichlorobenzene	29.5	U	59.0	17.7	ug/Kg	1		01/08/18 23:48
1,2,3-Trichloropropane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,2,4-Trichlorobenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,2,4-Trimethylbenzene	29.5	U	59.0	17.7	ug/Kg	1		01/08/18 23:48
1,2-Dibromo-3-chloropropane	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
1,2-Dibromoethane	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
1,2-Dichlorobenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,2-Dichloroethane	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
1,2-Dichloropropane	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
1,3,5-Trimethylbenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,3-Dichlorobenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
1,3-Dichloropropane	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
1,4-Dichlorobenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
2,2-Dichloropropane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
2-Butanone (MEK)	148	U	295	92.1	ug/Kg	1		01/08/18 23:48
2-Chlorotoluene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
2-Hexanone	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
4-Chlorotoluene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
4-Isopropyltoluene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
4-Methyl-2-pentanone (MIBK)	148	U	295	92.1	ug/Kg	1		01/08/18 23:48
Benzene	7.40	U	14.8	4.60	ug/Kg	1		01/08/18 23:48
Bromobenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Bromochloromethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Bromodichloromethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Bromoform	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Bromomethane	118	U	236	73.2	ug/Kg	1		01/08/18 23:48
Carbon disulfide	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
Carbon tetrachloride	7.40	U	14.8	4.60	ug/Kg	1		01/08/18 23:48
Chlorobenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Chloroethane	118	U	236	73.2	ug/Kg	1		01/08/18 23:48

Results of **17604-B7S5**

Client Sample ID: **17604-B7S5**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087003
Lab Project ID: 1180087

Collection Date: 01/04/18 11:45
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Chloromethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
cis-1,2-Dichloroethene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
cis-1,3-Dichloropropene	7.40	U	14.8	4.60	ug/Kg	1		01/08/18 23:48
Dibromochloromethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Dibromomethane	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Dichlorodifluoromethane	29.5	U	59.0	17.7	ug/Kg	1		01/08/18 23:48
Ethylbenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Freon-113	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
Hexachlorobutadiene	11.8	U	23.6	7.32	ug/Kg	1		01/08/18 23:48
Isopropylbenzene (Cumene)	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Methylene chloride	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
Methyl-t-butyl ether	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
Naphthalene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
n-Butylbenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
n-Propylbenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
o-Xylene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
P & M -Xylene	29.5	U	59.0	17.7	ug/Kg	1		01/08/18 23:48
sec-Butylbenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Styrene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
tert-Butylbenzene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
Tetrachloroethene	7.40	U	14.8	4.60	ug/Kg	1		01/08/18 23:48
Toluene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
trans-1,2-Dichloroethene	14.8	U	29.5	9.21	ug/Kg	1		01/08/18 23:48
trans-1,3-Dichloropropene	7.40	U	14.8	4.60	ug/Kg	1		01/08/18 23:48
Trichloroethene	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
Trichlorofluoromethane	29.5	U	59.0	17.7	ug/Kg	1		01/08/18 23:48
Vinyl acetate	59.0	U	118	36.6	ug/Kg	1		01/08/18 23:48
Vinyl chloride	5.90	U	11.8	3.66	ug/Kg	1		01/08/18 23:48
Xylenes (total)	44.3	U	88.5	26.9	ug/Kg	1		01/08/18 23:48
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		71-136		%	1		01/08/18 23:48
4-Bromofluorobenzene (surr)	126		55-151		%	1		01/08/18 23:48
Toluene-d8 (surr)	94.5		85-116		%	1		01/08/18 23:48

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J flagging is activated

Results of **17604-B7S5**

Client Sample ID: **17604-B7S5**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087003
Lab Project ID: 1180087

Collection Date: 01/04/18 11:45
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):88.3
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 01/08/18 23:48
Container ID: 1180087003-B

Prep Batch: VXX31862
Prep Method: SW5035A
Prep Date/Time: 01/04/18 11:45
Prep Initial Wt./Vol.: 61.94 g
Prep Extract Vol: 32.2666 mL

Results of **17604-B8S4**

Client Sample ID: **17604-B8S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087004
Lab Project ID: 1180087

Collection Date: 01/04/18 12:20
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):87.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
2-Methylnaphthalene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Acenaphthene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Acenaphthylene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Anthracene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Benzo(a)Anthracene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Benzo[a]pyrene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Benzo[b]Fluoranthene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Benzo[g,h,i]perylene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Benzo[k]fluoranthene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Chrysene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Dibenzo[a,h]anthracene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Fluoranthene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Fluorene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Indeno[1,2,3-c,d] pyrene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Naphthalene	11.3	U	22.6	5.64	ug/Kg	1		01/12/18 18:08
Phenanthrene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Pyrene	14.1	U	28.2	7.05	ug/Kg	1		01/12/18 18:08
Surrogates								
2-Methylnaphthalene-d10 (surr)	73.3		50-150		%	1		01/12/18 18:08
Fluoranthene-d10 (surr)	84.5		50-150		%	1		01/12/18 18:08

Batch Information

Analytical Batch: XMS10609
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 01/12/18 18:08
Container ID: 1180087004-A

Prep Batch: XXX38993
Prep Method: SW3550C
Prep Date/Time: 01/12/18 07:47
Prep Initial Wt./Vol.: 22.853 g
Prep Extract Vol: 5 mL

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B8S4**

Client Sample ID: **17604-B8S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087004
Lab Project ID: 1180087

Collection Date: 01/04/18 12:20
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):87.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.3	U	22.5	6.99	mg/Kg	1		01/15/18 20:08
Surrogates								
5a Androstane (surr)	85.3		50-150		%	1		01/15/18 20:08

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/15/18 20:08
Container ID: 1180087004-A

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 01/11/18 08:53
Prep Initial Wt./Vol.: 30.493 g
Prep Extract Vol: 1 mL

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B8S4**

Client Sample ID: **17604-B8S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087004
Lab Project ID: 1180087

Collection Date: 01/04/18 12:20
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):87.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	8.85	U	17.7	5.50	ug/Kg	1		01/09/18 00:05
1,1,1-Trichloroethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,1,2,2-Tetrachloroethane	5.55	U	11.1	3.46	ug/Kg	1		01/09/18 00:05
1,1,2-Trichloroethane	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
1,1-Dichloroethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,1-Dichloroethene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,1-Dichloropropene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,2,3-Trichlorobenzene	22.2	U	44.4	13.3	ug/Kg	1		01/09/18 00:05
1,2,3-Trichloropropane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,2,4-Trichlorobenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,2,4-Trimethylbenzene	22.2	U	44.4	13.3	ug/Kg	1		01/09/18 00:05
1,2-Dibromo-3-chloropropane	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
1,2-Dibromoethane	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
1,2-Dichlorobenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,2-Dichloroethane	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
1,2-Dichloropropane	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
1,3,5-Trimethylbenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,3-Dichlorobenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
1,3-Dichloropropane	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
1,4-Dichlorobenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
2,2-Dichloropropane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
2-Butanone (MEK)	111	U	222	69.2	ug/Kg	1		01/09/18 00:05
2-Chlorotoluene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
2-Hexanone	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
4-Chlorotoluene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
4-Isopropyltoluene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
4-Methyl-2-pentanone (MIBK)	111	U	222	69.2	ug/Kg	1		01/09/18 00:05
Benzene	5.55	U	11.1	3.46	ug/Kg	1		01/09/18 00:05
Bromobenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Bromochloromethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Bromodichloromethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Bromoform	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Bromomethane	88.5	U	177	55.0	ug/Kg	1		01/09/18 00:05
Carbon disulfide	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
Carbon tetrachloride	5.55	U	11.1	3.46	ug/Kg	1		01/09/18 00:05
Chlorobenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Chloroethane	88.5	U	177	55.0	ug/Kg	1		01/09/18 00:05

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Results of **17604-B8S4**

Client Sample ID: **17604-B8S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087004
Lab Project ID: 1180087

Collection Date: 01/04/18 12:20
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):87.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Chloromethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
cis-1,2-Dichloroethene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
cis-1,3-Dichloropropene	5.55	U	11.1	3.46	ug/Kg	1		01/09/18 00:05
Dibromochloromethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Dibromomethane	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Dichlorodifluoromethane	22.2	U	44.4	13.3	ug/Kg	1		01/09/18 00:05
Ethylbenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Freon-113	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
Hexachlorobutadiene	8.85	U	17.7	5.50	ug/Kg	1		01/09/18 00:05
Isopropylbenzene (Cumene)	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Methylene chloride	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
Methyl-t-butyl ether	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
Naphthalene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
n-Butylbenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
n-Propylbenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
o-Xylene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
P & M -Xylene	22.2	U	44.4	13.3	ug/Kg	1		01/09/18 00:05
sec-Butylbenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Styrene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
tert-Butylbenzene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
Tetrachloroethene	5.55	U	11.1	3.46	ug/Kg	1		01/09/18 00:05
Toluene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
trans-1,2-Dichloroethene	11.1	U	22.2	6.92	ug/Kg	1		01/09/18 00:05
trans-1,3-Dichloropropene	5.55	U	11.1	3.46	ug/Kg	1		01/09/18 00:05
Trichloroethene	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
Trichlorofluoromethane	22.2	U	44.4	13.3	ug/Kg	1		01/09/18 00:05
Vinyl acetate	44.4	U	88.7	27.5	ug/Kg	1		01/09/18 00:05
Vinyl chloride	4.43	U	8.87	2.75	ug/Kg	1		01/09/18 00:05
Xylenes (total)	33.3	U	66.6	20.2	ug/Kg	1		01/09/18 00:05
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		01/09/18 00:05
4-Bromofluorobenzene (surr)	139		55-151		%	1		01/09/18 00:05
Toluene-d8 (surr)	93.1		85-116		%	1		01/09/18 00:05

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J flagging is activated

Results of **17604-B8S4**

Client Sample ID: **17604-B8S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087004
Lab Project ID: 1180087

Collection Date: 01/04/18 12:20
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):87.3
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 01/09/18 00:05
Container ID: 1180087004-B

Prep Batch: VXX31862
Prep Method: SW5035A
Prep Date/Time: 01/04/18 12:20
Prep Initial Wt./Vol.: 96 g
Prep Extract Vol: 37.1895 mL

Results of **17604-B5S23**

Client Sample ID: **17604-B5S23**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087005
Lab Project ID: 1180087

Collection Date: 01/04/18 14:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	29.9		25.1	7.78	mg/Kg	1		01/15/18 20:18
Surrogates								
5a Androstane (surr)	76.5		50-150		%	1		01/15/18 20:18

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/15/18 20:18
Container ID: 1180087005-A

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 01/11/18 08:53
Prep Initial Wt./Vol.: 30.473 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **17604-B5S23**

Client Sample ID: **17604-B5S23**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087005
Lab Project ID: 1180087

Collection Date: 01/04/18 14:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	16.7	U	33.4	10.4	ug/Kg	1		01/09/18 00:22
1,1,1-Trichloroethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,1,2,2-Tetrachloroethane	10.4	U	20.9	6.51	ug/Kg	1		01/09/18 00:22
1,1,2-Trichloroethane	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
1,1-Dichloroethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,1-Dichloroethene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,1-Dichloropropene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,2,3-Trichlorobenzene	41.8	U	83.5	25.1	ug/Kg	1		01/09/18 00:22
1,2,3-Trichloropropane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,2,4-Trichlorobenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,2,4-Trimethylbenzene	41.8	U	83.5	25.1	ug/Kg	1		01/09/18 00:22
1,2-Dibromo-3-chloropropane	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
1,2-Dibromoethane	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
1,2-Dichlorobenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,2-Dichloroethane	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
1,2-Dichloropropane	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
1,3,5-Trimethylbenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,3-Dichlorobenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
1,3-Dichloropropane	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
1,4-Dichlorobenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
2,2-Dichloropropane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
2-Butanone (MEK)	209	U	418	130	ug/Kg	1		01/09/18 00:22
2-Chlorotoluene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
2-Hexanone	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
4-Chlorotoluene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
4-Isopropyltoluene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
4-Methyl-2-pentanone (MIBK)	209	U	418	130	ug/Kg	1		01/09/18 00:22
Benzene	10.4	U	20.9	6.51	ug/Kg	1		01/09/18 00:22
Bromobenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Bromochloromethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Bromodichloromethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Bromoform	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Bromomethane	167	U	334	104	ug/Kg	1		01/09/18 00:22
Carbon disulfide	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
Carbon tetrachloride	10.4	U	20.9	6.51	ug/Kg	1		01/09/18 00:22
Chlorobenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Chloroethane	167	U	334	104	ug/Kg	1		01/09/18 00:22

Results of **17604-B5S23**

Client Sample ID: **17604-B5S23**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087005
Lab Project ID: 1180087

Collection Date: 01/04/18 14:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Chloromethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
cis-1,2-Dichloroethene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
cis-1,3-Dichloropropene	10.4	U	20.9	6.51	ug/Kg	1		01/09/18 00:22
Dibromochloromethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Dibromomethane	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Dichlorodifluoromethane	41.8	U	83.5	25.1	ug/Kg	1		01/09/18 00:22
Ethylbenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Freon-113	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
Hexachlorobutadiene	16.7	U	33.4	10.4	ug/Kg	1		01/09/18 00:22
Isopropylbenzene (Cumene)	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Methylene chloride	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
Methyl-t-butyl ether	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
Naphthalene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
n-Butylbenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
n-Propylbenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
o-Xylene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
P & M -Xylene	41.8	U	83.5	25.1	ug/Kg	1		01/09/18 00:22
sec-Butylbenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Styrene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
tert-Butylbenzene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
Tetrachloroethene	10.4	U	20.9	6.51	ug/Kg	1		01/09/18 00:22
Toluene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
trans-1,2-Dichloroethene	20.9	U	41.8	13.0	ug/Kg	1		01/09/18 00:22
trans-1,3-Dichloropropene	10.4	U	20.9	6.51	ug/Kg	1		01/09/18 00:22
Trichloroethene	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
Trichlorofluoromethane	41.8	U	83.5	25.1	ug/Kg	1		01/09/18 00:22
Vinyl acetate	83.5	U	167	51.8	ug/Kg	1		01/09/18 00:22
Vinyl chloride	8.35	U	16.7	5.18	ug/Kg	1		01/09/18 00:22
Xylenes (total)	62.5	U	125	38.1	ug/Kg	1		01/09/18 00:22
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		01/09/18 00:22
4-Bromofluorobenzene (surr)	85.1		55-151		%	1		01/09/18 00:22
Toluene-d8 (surr)	94.5		85-116		%	1		01/09/18 00:22

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J flagging is activated

Results of **17604-B5S23**

Client Sample ID: **17604-B5S23**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087005
Lab Project ID: 1180087

Collection Date: 01/04/18 14:10
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):78.5
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 01/09/18 00:22
Container ID: 1180087005-B

Prep Batch: VXX31862
Prep Method: SW5035A
Prep Date/Time: 01/04/18 14:10
Prep Initial Wt./Vol.: 56.82 g
Prep Extract Vol: 37.2332 mL

Results of **17604-B7S4**

Client Sample ID: **17604-B7S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087007
Lab Project ID: 1180087

Collection Date: 01/04/18 11:30
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):34.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	534		231	71.6	mg/Kg	4		01/15/18 21:16
Surrogates								
5a Androstane (surr)	106		50-150		%	4		01/15/18 21:16

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/15/18 21:16
Container ID: 1180087007-A

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 01/11/18 08:53
Prep Initial Wt./Vol.: 30.354 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **17604-B7S4**

Client Sample ID: **17604-B7S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087007
Lab Project ID: 1180087

Collection Date: 01/04/18 11:30
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):34.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	95.0	U	190	59.0	ug/Kg	1		01/10/18 20:45
1,1,1-Trichloroethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,1,2,2-Tetrachloroethane	59.5	U	119	37.1	ug/Kg	1		01/10/18 20:45
1,1,2-Trichloroethane	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
1,1-Dichloroethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,1-Dichloroethene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,1-Dichloropropene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,2,3-Trichlorobenzene	238	U	476	143	ug/Kg	1		01/10/18 20:45
1,2,3-Trichloropropane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,2,4-Trichlorobenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,2,4-Trimethylbenzene	238	U	476	143	ug/Kg	1		01/10/18 20:45
1,2-Dibromo-3-chloropropane	476	U	952	295	ug/Kg	1		01/10/18 20:45
1,2-Dibromoethane	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
1,2-Dichlorobenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,2-Dichloroethane	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
1,2-Dichloropropane	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
1,3,5-Trimethylbenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,3-Dichlorobenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
1,3-Dichloropropane	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
1,4-Dichlorobenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
2,2-Dichloropropane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
2-Butanone (MEK)	1190	U	2380	743	ug/Kg	1		01/10/18 20:45
2-Chlorotoluene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
2-Hexanone	476	U	952	295	ug/Kg	1		01/10/18 20:45
4-Chlorotoluene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
4-Isopropyltoluene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
4-Methyl-2-pentanone (MIBK)	1190	U	2380	743	ug/Kg	1		01/10/18 20:45
Benzene	59.5	U	119	37.1	ug/Kg	1		01/10/18 20:45
Bromobenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Bromochloromethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Bromodichloromethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Bromoform	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Bromomethane	950	U	1900	590	ug/Kg	1		01/10/18 20:45
Carbon disulfide	476	U	952	295	ug/Kg	1		01/10/18 20:45
Carbon tetrachloride	59.5	U	119	37.1	ug/Kg	1		01/10/18 20:45
Chlorobenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Chloroethane	950	U	1900	590	ug/Kg	1		01/10/18 20:45

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B7S4**

Client Sample ID: **17604-B7S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087007
Lab Project ID: 1180087

Collection Date: 01/04/18 11:30
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):34.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Chloromethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
cis-1,2-Dichloroethene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
cis-1,3-Dichloropropene	59.5	U	119	37.1	ug/Kg	1		01/10/18 20:45
Dibromochloromethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Dibromomethane	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Dichlorodifluoromethane	238	U	476	143	ug/Kg	1		01/10/18 20:45
Ethylbenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Freon-113	476	U	952	295	ug/Kg	1		01/10/18 20:45
Hexachlorobutadiene	95.0	U	190	59.0	ug/Kg	1		01/10/18 20:45
Isopropylbenzene (Cumene)	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Methylene chloride	476	U	952	295	ug/Kg	1		01/10/18 20:45
Methyl-t-butyl ether	476	U	952	295	ug/Kg	1		01/10/18 20:45
Naphthalene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
n-Butylbenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
n-Propylbenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
o-Xylene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
P & M -Xylene	238	U	476	143	ug/Kg	1		01/10/18 20:45
sec-Butylbenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Styrene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
tert-Butylbenzene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
Tetrachloroethene	59.5	U	119	37.1	ug/Kg	1		01/10/18 20:45
Toluene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
trans-1,2-Dichloroethene	119	U	238	74.3	ug/Kg	1		01/10/18 20:45
trans-1,3-Dichloropropene	59.5	U	119	37.1	ug/Kg	1		01/10/18 20:45
Trichloroethene	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
Trichlorofluoromethane	238	U	476	143	ug/Kg	1		01/10/18 20:45
Vinyl acetate	476	U	952	295	ug/Kg	1		01/10/18 20:45
Vinyl chloride	47.6	U	95.2	29.5	ug/Kg	1		01/10/18 20:45
Xylenes (total)	357	U	714	217	ug/Kg	1		01/10/18 20:45
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		01/10/18 20:45
4-Bromofluorobenzene (surr)	66		55-151		%	1		01/10/18 20:45
Toluene-d8 (surr)	94		85-116		%	1		01/10/18 20:45

Print Date: 01/16/2018 2:33:53PM

J flagging is activated

Results of **17604-B7S4**

Client Sample ID: **17604-B7S4**
Client Project ID: **32-1-17604-4 Warning Lights**
Lab Sample ID: 1180087007
Lab Project ID: 1180087

Collection Date: 01/04/18 11:30
Received Date: 01/05/18 10:43
Matrix: Soil/Solid (dry weight)
Solids (%):34.3
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17547
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 01/10/18 20:45
Container ID: 1180087007-B

Prep Batch: VXX31871
Prep Method: SW5035A
Prep Date/Time: 01/04/18 11:30
Prep Initial Wt./Vol.: 25.674 g
Prep Extract Vol: 41.8791 mL

Method Blank

Blank ID: MB for HBN 1773929 [SPT/10391]
Blank Lab ID: 1431283

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10391
Analytical Method: SM21 2540G
Instrument:
Analyst: NW
Analytical Date/Time: 1/9/2018 6:15:00PM

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Duplicate Sample Summary

Original Sample ID: 1180087005
Duplicate Sample ID: 1431284
Analysis Date: 01/09/2018 18:15
Matrix: Soil/Solid (dry weight)

QC for Samples:

1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	78.5	78.9	%	0.58	(< 15)

Batch Information

Analytical Batch: SPT10391
Analytical Method: SM21 2540G
Instrument:
Analyst: NW

Print Date: 01/16/2018 2:33:55PM

Method Blank

Blank ID: MB for HBN 1774012 [SPT/10393]
Blank Lab ID: 1431581

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087007

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10393
Analytical Method: SM21 2540G
Instrument:
Analyst: A.L
Analytical Date/Time: 1/11/2018 3:02:00PM

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Duplicate Sample Summary

Original Sample ID: 1180087007
Duplicate Sample ID: 1431582
QC for Samples:
1180087007

Analysis Date: 01/11/2018 15:02
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	34.3	33.8	%	1.30	(< 15)

Batch Information

Analytical Batch: SPT10393
Analytical Method: SM21 2540G
Instrument:
Analyst: A.L

Print Date: 01/16/2018 2:33:59PM

Method Blank

Blank ID: MB for HBN 1773915 [VXX/31862]
Blank Lab ID: 1431225

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
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	6.25U	12.5	3.90	ug/Kg
1,1,2-Trichloroethane	5.00U	10.0	3.10	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	12.5U	25.0	7.80	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	5.00U	10.0	3.10	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	5.00U	10.0	3.10	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)	109J	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	12.5U	25.0	7.80	ug/Kg
4-Methyl-2-pentanone (MIBK)	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	12.5U	25.0	7.80	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Bromomethane	100U	200	62.0	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
Chloroform	12.5U	25.0	7.80	ug/Kg

Method Blank

Blank ID: MB for HBN 1773915 [VXX/31862]
Blank Lab ID: 1431225

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
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	12.5U	25.0	7.80	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	5.00U	10.0	3.10	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	107	71-136		%
4-Bromofluorobenzene (surr)	109	55-151		%
Toluene-d8 (surr)	92.1	85-116		%

Method Blank

Blank ID: MB for HBN 1773915 [VXX/31862]
Blank Lab ID: 1431225

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: NRO
Analytical Date/Time: 1/8/2018 4:56:00PM

Prep Batch: VXX31862
Prep Method: SW5035A
Prep Date/Time: 1/8/2018 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [VXX31862]
Blank Spike Lab ID: 1431226
Date Analyzed: 01/08/2018 17:13

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	729	97	(78-125)
1,1,1-Trichloroethane	750	724	97	(73-130)
1,1,2,2-Tetrachloroethane	750	691	92	(70-124)
1,1,2-Trichloroethane	750	744	99	(78-121)
1,1-Dichloroethane	750	724	97	(76-125)
1,1-Dichloroethene	750	725	97	(70-131)
1,1-Dichloropropene	750	730	97	(76-125)
1,2,3-Trichlorobenzene	750	663	88	(66-130)
1,2,3-Trichloropropane	750	681	91	(73-125)
1,2,4-Trichlorobenzene	750	685	91	(67-129)
1,2,4-Trimethylbenzene	750	682	91	(75-123)
1,2-Dibromo-3-chloropropane	750	655	87	(61-132)
1,2-Dibromoethane	750	752	100	(78-122)
1,2-Dichlorobenzene	750	688	92	(78-121)
1,2-Dichloroethane	750	760	101	(73-128)
1,2-Dichloropropane	750	734	98	(76-123)
1,3,5-Trimethylbenzene	750	673	90	(73-124)
1,3-Dichlorobenzene	750	687	92	(77-121)
1,3-Dichloropropane	750	751	100	(77-121)
1,4-Dichlorobenzene	750	689	92	(75-120)
2,2-Dichloropropane	750	749	100	(67-133)
2-Butanone (MEK)	2250	2170	96	(51-148)
2-Chlorotoluene	750	657	88	(75-122)
2-Hexanone	2250	2080	93	(53-145)
4-Chlorotoluene	750	677	90	(72-124)
4-Isopropyltoluene	750	690	92	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2110	94	(65-135)
Benzene	750	728	97	(77-121)
Bromobenzene	750	689	92	(78-121)
Bromochloromethane	750	766	102	(78-125)
Bromodichloromethane	750	744	99	(75-127)
Bromoform	750	744	99	(67-132)
Bromomethane	750	752	100	(53-143)
Carbon disulfide	1130	1090	97	(63-132)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [VXX31862]
Blank Spike Lab ID: 1431226
Date Analyzed: 01/08/2018 17:13

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon tetrachloride	750	699	93	(70-135)
Chlorobenzene	750	714	95	(79-120)
Chloroethane	750	726	97	(59-139)
Chloroform	750	738	98	(78-123)
Chloromethane	750	760	101	(50-136)
cis-1,2-Dichloroethene	750	695	93	(77-123)
cis-1,3-Dichloropropene	750	775	103	(74-126)
Dibromochloromethane	750	756	101	(74-126)
Dibromomethane	750	737	98	(78-125)
Dichlorodifluoromethane	750	727	97	(29-149)
Ethylbenzene	750	704	94	(76-122)
Freon-113	1130	1100	98	(66-136)
Hexachlorobutadiene	750	697	93	(61-135)
Isopropylbenzene (Cumene)	750	721	96	(68-134)
Methylene chloride	750	756	101	(70-128)
Methyl-t-butyl ether	1130	1140	101	(73-125)
Naphthalene	750	644	86	(62-129)
n-Butylbenzene	750	696	93	(70-128)
n-Propylbenzene	750	700	93	(73-125)
o-Xylene	750	720	96	(77-123)
P & M -Xylene	1500	1440	96	(77-124)
sec-Butylbenzene	750	701	93	(73-126)
Styrene	750	709	95	(76-124)
tert-Butylbenzene	750	711	95	(73-125)
Tetrachloroethene	750	694	93	(73-128)
Toluene	750	695	93	(77-121)
trans-1,2-Dichloroethene	750	728	97	(74-125)
trans-1,3-Dichloropropene	750	775	103	(71-130)
Trichloroethene	750	724	97	(77-123)
Trichlorofluoromethane	750	773	103	(62-140)
Vinyl acetate	750	716	95	(50-151)
Vinyl chloride	750	770	103	(56-135)
Xylenes (total)	2250	2160	96	(78-124)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [VXX31862]
Blank Spike Lab ID: 1431226
Date Analyzed: 01/08/2018 17:13

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

		Blank Spike (%)		
Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	96.6	97	(71-136)
4-Bromofluorobenzene (surr)	750	104	104	(55-151)
Toluene-d8 (surr)	750	98.3	98	(85-116)

Batch Information

Analytical Batch: **VMS17545**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **NRO**

Prep Batch: **VXX31862**
Prep Method: **SW5035A**
Prep Date/Time: **01/08/2018 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1180087001
MS Sample ID: 1431227 MS
MSD Sample ID: 1431228 MSD

Analysis Date: 01/08/2018 23:14
Analysis Date: 01/08/2018 17:51
Analysis Date: 01/08/2018 18:07
Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	14.7U	972	931	96	972	954	98	78-125	2.50	(< 20)
1,1,1-Trichloroethane	18.3U	972	948	98	972	973	100	73-130	2.60	(< 20)
1,1,2,2-Tetrachloroethane	9.15U	972	889	92	972	906	93	70-124	1.80	(< 20)
1,1,2-Trichloroethane	7.35U	972	931	96	972	949	98	78-121	2.10	(< 20)
1,1-Dichloroethane	18.3U	972	927	96	972	962	99	76-125	3.60	(< 20)
1,1-Dichloroethene	18.3U	972	960	99	972	986	101	70-131	2.70	(< 20)
1,1-Dichloropropene	18.3U	972	953	98	972	979	101	76-125	2.70	(< 20)
1,2,3-Trichlorobenzene	36.6U	972	750	77	972	895	92	66-130	17.60	(< 20)
1,2,3-Trichloropropane	18.3U	972	879	91	972	904	93	73-125	2.70	(< 20)
1,2,4-Trichlorobenzene	18.3U	972	789	81	972	885	91	67-129	11.50	(< 20)
1,2,4-Trimethylbenzene	36.6U	972	850	88	972	869	89	75-123	2.20	(< 20)
1,2-Dibromo-3-chloropropane	73.5U	972	787	81	972	873	90	61-132	10.30	(< 20)
1,2-Dibromoethane	7.35U	972	956	98	972	958	99	78-122	0.17	(< 20)
1,2-Dichlorobenzene	18.3U	972	848	87	972	868	89	78-121	2.30	(< 20)
1,2-Dichloroethane	7.35U	972	964	99	972	988	102	73-128	2.40	(< 20)
1,2-Dichloropropane	7.35U	972	930	96	972	958	99	76-123	3.10	(< 20)
1,3,5-Trimethylbenzene	18.3U	972	842	87	972	868	89	73-124	3.20	(< 20)
1,3-Dichlorobenzene	18.3U	972	848	87	972	871	90	77-121	2.70	(< 20)
1,3-Dichloropropane	7.35U	972	943	97	972	951	98	77-121	0.76	(< 20)
1,4-Dichlorobenzene	18.3U	972	849	88	972	867	89	75-120	2.00	(< 20)
2,2-Dichloropropane	18.3U	972	980	101	972	974	100	67-133	0.60	(< 20)
2-Butanone (MEK)	183U	2917	2509	86	2917	3016	104	51-148	18.50	(< 20)
2-Chlorotoluene	18.3U	972	881	91	972	839	86	75-122	4.80	(< 20)
2-Hexanone	73.5U	2917	2386	82	2917	2794	96	53-145	16.10	(< 20)
4-Chlorotoluene	18.3U	972	845	87	972	857	88	72-124	1.30	(< 20)
4-Isopropyltoluene	18.3U	972	870	90	972	881	91	73-127	1.30	(< 20)
4-Methyl-2-pentanone (MIBK)	183U	2917	2509	86	2917	2843	97	65-135	12.20	(< 20)
Benzene	9.15U	972	934	96	972	964	99	77-121	3.10	(< 20)
Bromobenzene	18.3U	972	868	89	972	885	91	78-121	2.00	(< 20)
Bromochloromethane	18.3U	972	981	101	972	994	102	78-125	1.30	(< 20)
Bromodichloromethane	18.3U	972	948	98	972	967	100	75-127	1.90	(< 20)
Bromoform	18.3U	972	942	97	972	964	99	67-132	2.40	(< 20)
Bromomethane	147U	972	1033	106	972	1031	106	53-143	0.13	(< 20)
Carbon disulfide	73.5U	1459	1422	98	1459	1471	101	63-132	3.20	(< 20)
Carbon tetrachloride	9.15U	972	927	95	972	947	98	70-135	2.20	(< 20)
Chlorobenzene	18.3U	972	891	92	972	920	95	79-120	3.10	(< 20)
Chloroethane	147U	972	969	100	972	989	102	59-139	2.00	(< 20)

Print Date: 01/16/2018 2:34:04PM

Matrix Spike Summary

Original Sample ID: 1180087001
MS Sample ID: 1431227 MS
MSD Sample ID: 1431228 MSD

Analysis Date: 01/08/2018 23:14
Analysis Date: 01/08/2018 17:51
Analysis Date: 01/08/2018 18:07
Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	18.3U	972	948	98	972	978	101	78-123	3.00	(< 20)
Chloromethane	18.3U	972	998	103	972	1011	104	50-136	1.40	(< 20)
cis-1,2-Dichloroethene	18.3U	972	888	91	972	918	95	77-123	3.50	(< 20)
cis-1,3-Dichloropropene	9.15U	972	979	101	972	996	103	74-126	1.70	(< 20)
Dibromochloromethane	18.3U	972	953	98	972	960	99	74-126	0.88	(< 20)
Dibromomethane	18.3U	972	937	97	972	956	98	78-125	1.90	(< 20)
Dichlorodifluoromethane	36.6U	972	952	98	972	973	100	29-149	2.20	(< 20)
Ethylbenzene	18.3U	972	891	92	972	907	93	76-122	1.80	(< 20)
Freon-113	73.5U	1459	1459	100	1459	1508	103	66-136	2.60	(< 20)
Hexachlorobutadiene	14.7U	972	843	87	972	879	91	61-135	4.20	(< 20)
Isopropylbenzene (Cumene)	18.3U	972	909	94	972	923	95	68-134	1.60	(< 20)
Methylene chloride	73.5U	972	968	100	972	998	103	70-128	3.00	(< 20)
Methyl-t-butyl ether	73.5U	1459	1434	99	1459	1483	101	73-125	2.70	(< 20)
Naphthalene	18.3U	972	760	78	972	891	92	62-129	15.90	(< 20)
n-Butylbenzene	18.3U	972	874	90	972	891	92	70-128	2.00	(< 20)
n-Propylbenzene	18.3U	972	886	91	972	892	92	73-125	0.73	(< 20)
o-Xylene	18.3U	972	901	93	972	918	95	77-123	1.80	(< 20)
P & M -Xylene	36.6U	1941	1817	93	1941	1817	93	77-124	0.22	(< 20)
sec-Butylbenzene	18.3U	972	892	92	972	909	94	73-126	1.80	(< 20)
Styrene	18.3U	972	884	91	972	897	92	76-124	1.60	(< 20)
tert-Butylbenzene	18.3U	972	889	92	972	899	93	73-125	1.20	(< 20)
Tetrachloroethene	9.15U	972	888	91	972	899	93	73-128	1.20	(< 20)
Toluene	18.3U	972	885	91	972	910	94	77-121	2.80	(< 20)
trans-1,2-Dichloroethene	18.3U	972	943	97	972	979	101	74-125	3.70	(< 20)
trans-1,3-Dichloropropene	9.15U	972	969	100	972	981	101	71-130	1.30	(< 20)
Trichloroethene	7.35U	972	931	96	972	967	100	77-123	3.80	(< 20)
Trichlorofluoromethane	36.6U	972	1360	140	972	1142	118	62-140	17.20	(< 20)
Vinyl acetate	73.5U	972	1088	112	972	855	88	50-151	23.90	* (< 20)
Vinyl chloride	7.35U	972	999	103	972	1022	105	56-135	2.30	(< 20)
Xylenes (total)	55.0U	2917	2707	93	2917	2732	94	78-124	0.75	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		972	960	99	972	963	99	71-136	0.17	
4-Bromofluorobenzene (surr)		1236	691	56	1236	695	56	55-151	0.42	
Toluene-d8 (surr)		972	958	99	972	959	99	85-116	0.14	

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1180087001
MS Sample ID: 1431227 MS
MSD Sample ID: 1431228 MSD

Analysis Date:
Analysis Date: 01/08/2018 17:51
Analysis Date: 01/08/2018 18:07
Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005

Results by **SW8260C**

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

Batch Information

Analytical Batch: VMS17545
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: NRO
Analytical Date/Time: 1/8/2018 5:51:00PM

Prep Batch: VXX31862
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 1/8/2018 6:00:00AM
Prep Initial Wt./Vol.: 62.35g
Prep Extract Vol: 32.79mL

Print Date: 01/16/2018 2:34:04PM

Method Blank

Blank ID: MB for HBN 1773986 [VXX/31871]
Blank Lab ID: 1431491

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
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	6.25U	12.5	3.90	ug/Kg
1,1,2-Trichloroethane	5.00U	10.0	3.10	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	12.5U	25.0	7.80	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	5.00U	10.0	3.10	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	5.00U	10.0	3.10	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)	119J	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	12.5U	25.0	7.80	ug/Kg
4-Methyl-2-pentanone (MIBK)	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	12.5U	25.0	7.80	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Bromomethane	100U	200	62.0	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
Chloroform	12.5U	25.0	7.80	ug/Kg

Method Blank

Blank ID: MB for HBN 1773986 [VXX/31871]
Blank Lab ID: 1431491

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
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	12.5U	25.0	7.80	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	5.00U	10.0	3.10	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	108	71-136		%
4-Bromofluorobenzene (surr)	87.9	55-151		%
Toluene-d8 (surr)	93.6	85-116		%

Method Blank

Blank ID: MB for HBN 1773986 [VXX/31871]
Blank Lab ID: 1431491

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17547
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: FDR
Analytical Date/Time: 1/10/2018 5:10:00PM

Prep Batch: VXX31871
Prep Method: SW5035A
Prep Date/Time: 1/10/2018 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 01/16/2018 2:34:05PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [VXX31871]
Blank Spike Lab ID: 1431492
Date Analyzed: 01/10/2018 17:27

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087007

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	771	103	(78-125)
1,1,1-Trichloroethane	750	809	108	(73-130)
1,1,2,2-Tetrachloroethane	750	703	94	(70-124)
1,1,2-Trichloroethane	750	768	102	(78-121)
1,1-Dichloroethane	750	790	105	(76-125)
1,1-Dichloroethene	750	813	108	(70-131)
1,1-Dichloropropene	750	821	110	(76-125)
1,2,3-Trichlorobenzene	750	693	92	(66-130)
1,2,3-Trichloropropane	750	692	92	(73-125)
1,2,4-Trichlorobenzene	750	713	95	(67-129)
1,2,4-Trimethylbenzene	750	743	99	(75-123)
1,2-Dibromo-3-chloropropane	750	637	85	(61-132)
1,2-Dibromoethane	750	766	102	(78-122)
1,2-Dichlorobenzene	750	714	95	(78-121)
1,2-Dichloroethane	750	792	106	(73-128)
1,2-Dichloropropane	750	779	104	(76-123)
1,3,5-Trimethylbenzene	750	741	99	(73-124)
1,3-Dichlorobenzene	750	722	96	(77-121)
1,3-Dichloropropane	750	764	102	(77-121)
1,4-Dichlorobenzene	750	725	97	(75-120)
2,2-Dichloropropane	750	830	111	(67-133)
2-Butanone (MEK)	2250	1960	87	(51-148)
2-Chlorotoluene	750	714	95	(75-122)
2-Hexanone	2250	1950	87	(53-145)
4-Chlorotoluene	750	720	96	(72-124)
4-Isopropyltoluene	750	763	102	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2060	92	(65-135)
Benzene	750	803	107	(77-121)
Bromobenzene	750	719	96	(78-121)
Bromochloromethane	750	799	107	(78-125)
Bromodichloromethane	750	776	104	(75-127)
Bromoform	750	743	99	(67-132)
Bromomethane	750	797	106	(53-143)
Carbon disulfide	1130	1210	108	(63-132)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [VXX31871]
Blank Spike Lab ID: 1431492
Date Analyzed: 01/10/2018 17:27

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087007

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon tetrachloride	750	771	103	(70-135)
Chlorobenzene	750	759	101	(79-120)
Chloroethane	750	776	103	(59-139)
Chloroform	750	798	106	(78-123)
Chloromethane	750	808	108	(50-136)
cis-1,2-Dichloroethene	750	753	100	(77-123)
cis-1,3-Dichloropropene	750	806	107	(74-126)
Dibromochloromethane	750	761	101	(74-126)
Dibromomethane	750	755	101	(78-125)
Dichlorodifluoromethane	750	712	95	(29-149)
Ethylbenzene	750	774	103	(76-122)
Freon-113	1130	1200	106	(66-136)
Hexachlorobutadiene	750	760	101	(61-135)
Isopropylbenzene (Cumene)	750	782	104	(68-134)
Methylene chloride	750	811	108	(70-128)
Methyl-t-butyl ether	1130	1170	104	(73-125)
Naphthalene	750	659	88	(62-129)
n-Butylbenzene	750	771	103	(70-128)
n-Propylbenzene	750	758	101	(73-125)
o-Xylene	750	765	102	(77-123)
P & M -Xylene	1500	1550	103	(77-124)
sec-Butylbenzene	750	771	103	(73-126)
Styrene	750	745	99	(76-124)
tert-Butylbenzene	750	774	103	(73-125)
Tetrachloroethene	750	764	102	(73-128)
Toluene	750	761	101	(77-121)
trans-1,2-Dichloroethene	750	812	108	(74-125)
trans-1,3-Dichloropropene	750	782	104	(71-130)
Trichloroethene	750	811	108	(77-123)
Trichlorofluoromethane	750	797	106	(62-140)
Vinyl acetate	750	757	101	(50-151)
Vinyl chloride	750	821	109	(56-135)
Xylenes (total)	2250	2310	103	(78-124)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [VXX31871]
Blank Spike Lab ID: 1431492
Date Analyzed: 01/10/2018 17:27

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087007

Results by **SW8260C**

		Blank Spike (%)		
Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	97	97	(71-136)
4-Bromofluorobenzene (surr)	750	86.8	87	(55-151)
Toluene-d8 (surr)	750	98	98	(85-116)

Batch Information

Analytical Batch: **VMS17547**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **FDR**

Prep Batch: **VXX31871**
Prep Method: **SW5035A**
Prep Date/Time: **01/10/2018 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1431493
MS Sample ID: 1431497 MS
MSD Sample ID: 1431498 MSD

QC for Samples: 1180087007

Analysis Date: 01/10/2018 21:02
Analysis Date: 01/10/2018 18:29
Analysis Date: 01/10/2018 18:46
Matrix: Soil/Solid (dry weight)

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	7.90U	594	566	95	594	570	96	78-125	0.77	(< 20)
1,1,1-Trichloroethane	9.90U	594	598	101	594	595	100	73-130	0.63	(< 20)
1,1,2,2-Tetrachloroethane	4.95U	594	532	90	594	532	90	70-124	0.04	(< 20)
1,1,2-Trichloroethane	3.96U	594	573	97	594	575	97	78-121	0.45	(< 20)
1,1-Dichloroethane	9.90U	594	579	98	594	579	98	76-125	0.00	(< 20)
1,1-Dichloroethene	9.90U	594	610	103	594	601	101	70-131	1.50	(< 20)
1,1-Dichloropropene	9.90U	594	603	102	594	600	101	76-125	0.59	(< 20)
1,2,3-Trichlorobenzene	19.8U	594	443	75	594	534	90	66-130	18.70	(< 20)
1,2,3-Trichloropropane	9.90U	594	527	89	594	535	90	73-125	1.50	(< 20)
1,2,4-Trichlorobenzene	9.90U	594	473	80	594	535	90	67-129	12.30	(< 20)
1,2,4-Trimethylbenzene	19.8U	594	535	90	594	528	89	75-123	1.50	(< 20)
1,2-Dibromo-3-chloropropane	39.5U	594	465	78	594	514	87	61-132	10.10	(< 20)
1,2-Dibromoethane	3.96U	594	581	98	594	581	98	78-122	0.00	(< 20)
1,2-Dichlorobenzene	9.90U	594	521	88	594	523	88	78-121	0.38	(< 20)
1,2-Dichloroethane	3.96U	594	590	99	594	592	100	73-128	0.33	(< 20)
1,2-Dichloropropane	3.96U	594	574	97	594	573	97	76-123	0.14	(< 20)
1,3,5-Trimethylbenzene	9.90U	594	522	88	594	525	88	73-124	0.64	(< 20)
1,3-Dichlorobenzene	9.90U	594	525	89	594	519	87	77-121	1.20	(< 20)
1,3-Dichloropropane	3.96U	594	573	97	594	580	98	77-121	1.30	(< 20)
1,4-Dichlorobenzene	9.90U	594	519	87	594	517	87	75-120	0.34	(< 20)
2,2-Dichloropropane	9.90U	594	617	104	594	604	102	67-133	2.00	(< 20)
2-Butanone (MEK)	99.0U	1780	1440	81	1780	1770	99	51-148	20.80	* (< 20)
2-Chlorotoluene	9.90U	594	508	86	594	497	84	75-122	2.20	(< 20)
2-Hexanone	39.5U	1780	1380	78	1780	1650	93	53-145	17.80	(< 20)
4-Chlorotoluene	9.90U	594	519	87	594	512	86	72-124	1.30	(< 20)
4-Isopropyltoluene	9.90U	594	538	91	594	541	91	73-127	0.62	(< 20)
4-Methyl-2-pentanone (MIBK)	99.0U	1780	1490	83	1780	1670	94	65-135	11.90	(< 20)
Benzene	4.95U	594	582	98	594	583	98	77-121	0.14	(< 20)
Bromobenzene	9.90U	594	535	90	594	525	89	78-121	1.80	(< 20)
Bromochloromethane	9.90U	594	608	102	594	595	100	78-125	2.20	(< 20)
Bromodichloromethane	9.90U	594	581	98	594	574	97	75-127	1.20	(< 20)
Bromoform	9.90U	594	565	95	594	568	96	67-132	0.49	(< 20)
Bromomethane	79.0U	594	634	107	594	616	104	53-143	2.80	(< 20)
Carbon disulfide	39.5U	890	907	102	890	892	100	63-132	1.70	(< 20)
Carbon tetrachloride	4.95U	594	584	98	594	573	97	70-135	2.00	(< 20)
Chlorobenzene	9.90U	594	557	94	594	558	94	79-120	0.25	(< 20)
Chloroethane	79.0U	594	600	101	594	580	98	59-139	3.40	(< 20)

Print Date: 01/16/2018 2:34:08PM

Matrix Spike Summary

Original Sample ID: 1431493
MS Sample ID: 1431497 MS
MSD Sample ID: 1431498 MSD

QC for Samples: 1180087007

Analysis Date: 01/10/2018 21:02
Analysis Date: 01/10/2018 18:29
Analysis Date: 01/10/2018 18:46
Matrix: Soil/Solid (dry weight)

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	9.90U	594	583	98	594	584	98	78-123	0.20	(< 20)
Chloromethane	9.90U	594	613	103	594	591	100	50-136	3.70	(< 20)
cis-1,2-Dichloroethene	9.90U	594	552	93	594	553	93	77-123	0.21	(< 20)
cis-1,3-Dichloropropene	4.95U	594	602	101	594	597	101	74-126	0.92	(< 20)
Dibromochloromethane	9.90U	594	575	97	594	572	96	74-126	0.52	(< 20)
Dibromomethane	9.90U	594	573	97	594	574	97	78-125	0.10	(< 20)
Dichlorodifluoromethane	19.8U	594	566	95	594	545	92	29-149	3.80	(< 20)
Ethylbenzene	9.90U	594	556	94	594	559	94	76-122	0.60	(< 20)
Freon-113	39.5U	890	934	105	890	918	103	66-136	1.70	(< 20)
Hexachlorobutadiene	7.90U	594	596	100	594	608	102	61-135	2.10	(< 20)
Isopropylbenzene (Cumene)	9.90U	594	560	94	594	565	95	68-134	1.00	(< 20)
Methylene chloride	39.5U	594	602	101	594	603	102	70-128	0.26	(< 20)
Methyl-t-butyl ether	39.5U	890	877	98	890	890	100	73-125	1.50	(< 20)
Naphthalene	7.91J	594	442	73	594	530	88	62-129	18.10	(< 20)
n-Butylbenzene	9.90U	594	555	94	594	548	92	70-128	1.30	(< 20)
n-Propylbenzene	9.90U	594	546	92	594	535	90	73-125	2.00	(< 20)
o-Xylene	9.90U	594	556	94	594	561	95	77-123	0.96	(< 20)
P & M -Xylene	19.8U	1190	1130	95	1190	1130	96	77-124	0.54	(< 20)
sec-Butylbenzene	9.90U	594	557	94	594	546	92	73-126	2.00	(< 20)
Styrene	9.90U	594	541	91	594	551	93	76-124	1.80	(< 20)
tert-Butylbenzene	9.90U	594	556	94	594	546	92	73-125	1.80	(< 20)
Tetrachloroethene	4.95U	594	559	94	594	559	94	73-128	0.14	(< 20)
Toluene	8.51J	594	557	92	594	561	93	77-121	0.74	(< 20)
trans-1,2-Dichloroethene	9.90U	594	593	100	594	595	100	74-125	0.37	(< 20)
trans-1,3-Dichloropropene	4.95U	594	586	99	594	584	98	71-130	0.41	(< 20)
Trichloroethene	3.96U	594	591	100	594	583	98	77-123	1.30	(< 20)
Trichlorofluoromethane	19.8U	594	840	142 *	594	630	106	62-140	28.60	* (< 20)
Vinyl acetate	39.5U	594	664	112	594	579	98	50-151	13.70	(< 20)
Vinyl chloride	3.96U	594	622	105	594	605	102	56-135	2.60	(< 20)
Xylenes (total)	29.7U	1780	1680	95	1780	1700	95	78-124	0.68	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		594	580	98	594	578	97	71-136	0.27	
4-Bromofluorobenzene (surr)		989	931	94	989	916	93	55-151	1.70	
Toluene-d8 (surr)		594	580	98	594	581	98	85-116	0.24	

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Matrix Spike Summary

Original Sample ID: 1431493
MS Sample ID: 1431497 MS
MSD Sample ID: 1431498 MSD

QC for Samples: 1180087007

Analysis Date:
Analysis Date: 01/10/2018 18:29
Analysis Date: 01/10/2018 18:46
Matrix: Soil/Solid (dry weight)

Results by **SW8260C**

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

Batch Information

Analytical Batch: VMS17547
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: FDR
Analytical Date/Time: 1/10/2018 6:29:00PM

Prep Batch: VXX31871
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 1/10/2018 6:00:00AM
Prep Initial Wt./Vol.: 63.18g
Prep Extract Vol: 25.00mL

Print Date: 01/16/2018 2:34:08PM

Method Blank

Blank ID: MB for HBN 1773971 [XXX/38992]
Blank Lab ID: 1431448

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087001, 1180087002, 1180087003, 1180087004, 1180087005, 1180087007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	77.5	60-120		%

Batch Information

Analytical Batch: XFC14026
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 1/15/2018 5:23:00PM

Prep Batch: XXX38992
Prep Method: SW3550C
Prep Date/Time: 1/11/2018 8:53:23AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [XXX38992]
Blank Spike Lab ID: 1431449
Date Analyzed: 01/15/2018 17:33

Spike Duplicate ID: LCSD for HBN 1180087 [XXX38992]
Spike Duplicate Lab ID: 1431450
Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087001, 1180087002, 1180087003, 1180087004, 1180087005, 1180087007

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	160	96	167	162	97	(75-125)	1.30	(< 20)
Surrogates									
5a Androstane (surr)	3.33	90.7	91	3.33	92.1	92	(60-120)	1.50	

Batch Information

Analytical Batch: **XFC14026**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX38992**
Prep Method: **SW3550C**
Prep Date/Time: **01/11/2018 08:53**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1774010 [XXX/38993]
Blank Lab ID: 1431573

Matrix: Soil/Solid (dry weight)

QC for Samples:
1180087002, 1180087004

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
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
Surrogates				
2-Methylnaphthalene-d10 (surr)	76.3	50-150		%
Fluoranthene-d10 (surr)	78.1	50-150		%

Batch Information

Analytical Batch: XMS10609
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 1/12/2018 3:04:00PM

Prep Batch: XXX38993
Prep Method: SW3550C
Prep Date/Time: 1/12/2018 7:47:01AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 01/16/2018 2:34:13PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180087 [XXX38993]
Blank Spike Lab ID: 1431574
Date Analyzed: 01/12/2018 15:24

Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087002, 1180087004

Results by **8270D SIM (PAH)**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	82.1	74	(43-111)
2-Methylnaphthalene	111	76.7	69	(39-114)
Acenaphthene	111	84.4	76	(44-111)
Acenaphthylene	111	85.3	77	(39-116)
Anthracene	111	88.0	79	(50-114)
Benzo(a)Anthracene	111	90.9	82	(54-122)
Benzo[a]pyrene	111	85.6	77	(50-125)
Benzo[b]Fluoranthene	111	92.3	83	(53-128)
Benzo[g,h,i]perylene	111	91.0	82	(49-127)
Benzo[k]fluoranthene	111	89.5	81	(56-123)
Chrysene	111	96.6	87	(57-118)
Dibenzo[a,h]anthracene	111	91.1	82	(50-129)
Fluoranthene	111	93.5	84	(55-119)
Fluorene	111	87.2	79	(47-114)
Indeno[1,2,3-c,d] pyrene	111	90.8	82	(49-130)
Naphthalene	111	77.2	69	(38-111)
Phenanthrene	111	88.9	80	(49-113)
Pyrene	111	96.0	86	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111	73.4	73	(50-150)
Fluoranthene-d10 (surr)	111	79.3	79	(50-150)

Batch Information

Analytical Batch: **XMS10609**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **DSD**

Prep Batch: **XXX38993**
Prep Method: **SW3550C**
Prep Date/Time: **01/12/2018 07:47**
Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1180115010
MS Sample ID: 1431575 MS
MSD Sample ID: 1431576 MSD

Analysis Date: 01/12/2018 15:45
Analysis Date: 01/12/2018 16:05
Analysis Date: 01/12/2018 16:26
Matrix: Soil/Solid (dry weight)

QC for Samples: 1180087002, 1180087004

Results by **8270D SIM (PAH)**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)						
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1-Methylnaphthalene	106U	118	72.1J	62		118	74.7J	64		43-111	3.60	(< 20)
2-Methylnaphthalene	106U	118	68.0J	58		118	69.9J	60		39-114	2.80	(< 20)
Acenaphthene	106U	118	67.6J	58		118	69.5J	59		44-111	2.80	(< 20)
Acenaphthylene	106U	118	71.6J	61		118	75.3J	64		39-116	5.00	(< 20)
Anthracene	106U	118	68.5J	59		118	70.6J	60		50-114	2.90	(< 20)
Benzo(a)Anthracene	106U	118	77.8J	66		118	79.1J	67		54-122	1.80	(< 20)
Benzo[a]pyrene	106U	118	75.7J	36	*	118	85.4J	44	*	50-125	11.90	(< 20)
Benzo[b]Fluoranthene	106U	118	103J	30	*	118	123	47	*	53-128	17.70	(< 20)
Benzo[g,h,i]perylene	106U	118	77.8J	11	*	118	96.6J	27	*	49-127	21.70	* (< 20)
Benzo[k]fluoranthene	106U	118	56.5J	48	*	118	61.9J	53	*	56-123	9.10	(< 20)
Chrysene	110	118	86.1J	-21	*	118	75.1J	-30	*	57-118	13.60	(< 20)
Dibenzo[a,h]anthracene	106U	118	51.5J	44	*	118	53.8J	46	*	50-129	4.40	(< 20)
Fluoranthene	106U	118	90.5J	77		118	91.0J	78		55-119	0.68	(< 20)
Fluorene	106U	118	69.7J	60		118	74.3J	63		47-114	6.30	(< 20)
Indeno[1,2,3-c,d] pyrene	106U	118	44.6J	38	*	118	53.8J	46	*	49-130	18.60	(< 20)
Naphthalene	84.5U	118	66.6J	57		118	69.4J	59		38-111	4.00	(< 20)
Phenanthrene	106U	118	72.6J	62		118	73.5J	63		49-113	1.30	(< 20)
Pyrene	106U	118	101J	86		118	108	92		55-117	6.40	(< 20)
Surrogates												
2-Methylnaphthalene-d10 (surr)		118	65.4	56		118	66.2	56		50-150	1.30	
Fluoranthene-d10 (surr)		118	72.7	62		118	75.4	64		50-150	3.70	

Batch Information

Analytical Batch: XMS10609
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 1/12/2018 4:05:00PM

Prep Batch: XXX38993
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 1/12/2018 7:47:01AM
Prep Initial Wt./Vol.: 22.60g
Prep Extract Vol: 5.00mL

Print Date: 01/16/2018 2:34:17PM

1180087

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN OF CUSTODY RECORD

Laboratory SGS Page 1 of 1
Attn: Jillian

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

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

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

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

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRO by AK102	PAHs by EPA 8270D SIM	VOC by EPA 8260C				Total Number of Containers	Remarks/Matrix
17604-B5S3	(1) A-B	13:10	1/4/18		✓	✓		✓				2	Soil
17604-B6S4	(2) A-B	16:15	1/4/18		✓	✓	✓	✓					Soil
17604-B7S4	(7) A-B	11:30	1/4/18		✓	✓		✓					Soil *HOLD*
17604-B7S5	(3) A-B	11:45	1/4/18		✓	✓		✓					Soil
17604-B8S4	(4) A-B	12:20	1/4/18		✓	✓	✓	✓					Soil
17604-B5S23	(5) A-B	14:10	1/4/18		✓	✓		✓				↓	Soil
17604-STB	(6) A	10:00	1/4/18					✓				1	Lab supplied STB

Project Information	Sample Receipt
Project Number: 32-1-17604-4	Total Number of Containers
Project Name: Warning Lights	COC Seals/Intact? Y/N/NA: (N)
Contact: JHT, ADV	Received Good Cond./Cold: 1.5
Ongoing Project? Yes ☑ No ☐	Delivery Method: Hand Delivered #D24
Sampler: ADV	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: STANDARD
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Alena Voit Time: 10:43	Signature: Time:	Signature: Time:
Printed Name: Alena Voit Date: 1/5/18	Printed Name: Date:	Printed Name: Date:
Company: Shannon Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 10:43
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 1/5/18
Company:	Company:	Company: Nicholas Wells SGS

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

F-19-91/UR

No. 35438

Vlahovich, Jillian (Anchorage)

From: Alena Voigt <ADV@shanwil.com>
Sent: Tuesday, January 09, 2018 10:12 AM
To: Vlahovich, Jillian (Anchorage)
Subject: Work Order 1180087 - Run "On Hold" Sample

Morning!

Last Thursday I dropped some soil samples off, work order 1180087, job number 32-1-17604-004 (Warning Lights). There is one sample on hold that we would like to run.

Please contact me with questions.

Thank you,

-Alena

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Alena Voigt **|** Environmental Scientist
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
www.shannonwilson.com
Phone: (907) 561-2120 Fax: (907) 561-4483
Direct: (907) 433-3224 adv@shanwil.com

Excellence. Innovation. Service. Value.
We Help Our Clients Achieve Their Goals.

e-Sample Receipt Form

SGS Workorder #: **1180087**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	ABSENT
COC accompanied samples?	yes	
n/a **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 @ 1.5 °C Therm. ID: D24
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	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	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	yes	**The Trip Blank, Sample 6, was received without MeOH in it. The sand appeared to be wet, like it once contained MeOH. The sample will be cancelled per JAN.**
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	n/a	
Were all soil VOAs field extracted with MeOH+BFB?	no	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1180087001-A	No Preservative Required	OK			
1180087001-B	Methanol field pres. 4 C	OK			
1180087002-A	No Preservative Required	OK			
1180087002-B	Methanol field pres. 4 C	OK			
1180087003-A	No Preservative Required	OK			
1180087003-B	Methanol field pres. 4 C	OK			
1180087004-A	No Preservative Required	OK			
1180087004-B	Methanol field pres. 4 C	OK			
1180087005-A	No Preservative Required	OK			
1180087005-B	Methanol field pres. 4 C	OK			
1180087006-A	Methanol field pres. 4 C	OK			
1180087007-A	No Preservative Required	OK			
1180087007-B	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.
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.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: Additional Site Characterization Activities, at 591 West 67th Avenue, Anchorage, Alaska

Date: August 2018

Laboratory Report Date: January 16, 2018

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Jessa Tibbetts
Title: Environmental Scientist
Laboratory Name: SGS North America Inc.
Work Order Number: 1180087
ADEC File Number: 2100.26.580

(**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 (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
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 (Please explain.)
Comments**:**

b. Correct analyses requested? **Yes / No / *NA* (Please explain.)**
Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (6° ± 0° C)?
Yes / No / NA (Please explain.)
Comments: *The temperature blank was documented as 1.5° C.*

b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes / No / NA (Please explain.)**
Comments: *According to the laboratory, the trip blank was received without methanol. The sample was not analyzed.*

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

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments: *The lack of methanol in the trip blank sample was noted on the laboratory sample receipt.*

e. Data quality or usability affected? **Yes / No (Please Explain.)**
Comments: *As the trip blank could not be analyzed, it cannot be determined if cross-contamination occurred during sampling and/or transporting samples to the laboratory.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments: *The MSD RPD for vinyl acetate (23.9%) does not meet QC criteria.*

c. Were corrective actions documented? **Yes / No / NA (Please explain.)**
Comments:

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The case narrative does not comment on the data quality/usability; however, it is noted that vinyl acetate was not detected above the LOQ in the parent sample of the MS/MSD RPD.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA (Please explain.)**
Comments:

b. All applicable holding times met? **Yes / No / NA (Please explain.)**
Comments:

c. All soils reported on a dry-weight basis? **Yes / No / NA (Please explain.)**
Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA (Please explain.)**
Comments: *The LOQs for 1,1,2-trichloroethane, 1,2,3-trichloropropane, chloroform, and vinyl chloride are greater than the respective ADEC Method 2 soil cleanup levels.*

e. Data quality or usability affected? **(Please explain.)**
Comments *The data cannot be used to determine whether or not concentrations of 1,2,3-trichloropropane, 1,1,2-trichloroethane, chloroform, and vinyl chloride in the project samples are present greater than the respective ADEC Method Two soil cleanup levels but less than the LOQ.*

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA (Please explain.)**
Comments: *However, estimated concentrations of 2-Butanone (MEK) (109 µg/Kg and 119 µg/Kg) were detected in the method blanks associated with the project samples.*

iii. If above LOQ, what samples are affected? ***NA***
Comments: *Although not above the LOQ, all project samples are potentially affected by the method blank detection.*

iv. Do the affected sample(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

v. Data quality or usability affected? **(Please explain.)**
Comments: *Although estimated concentrations of 2-Butanone were detected in the method blanks, 2-Butanone concentrations were not detected in the associated project samples. Therefore, the data quality or usability is considered unaffected.*

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

i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples?
(LCS/LCSD required per AK methods, LCS required per SW846) **Yes / No / *NA***
(Please explain.)
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments: *Only organic analyses were requested with this work order.*

iii. Accuracy – All percent recoveries (%R) reported *and w*ithin method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

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

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

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

vii. Data quality or usability affected? Explain.
Comments*:*

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes / No / NA (Please explain.)**
Comments:

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

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain.
Comments:

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

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)**
Comments: *The trip blank was received without methanol in it and was not analyzed.*

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**
Comments: *All samples were transported in one cooler.*

iii. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

iv. If above LOQ, what samples are affected? **NA**
Comments**:**

v. Data quality or usability affected? Explain.
Comments: *It cannot be verified whether cross-contamination occurred during the sample transport and handling process.*

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples? **Yes / No / NA (Please explain.)**
Comments: *The duplicate sample set B5S3/B5S23 were submitted to the laboratory.*

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments:

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

iv. Data quality or usability affected? Explain. ***NA***
Comments:

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

Yes / No / NA (Please explain.) *Decontamination and equipment blanks were not included in our ADEC-approved Work Plan.*

i. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

ii. If results are above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Explain. ***NA***
Comments:

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

a. Are they defined and appropriate? **Yes / No / NA**
Comments: *Laboratory-specific flags are defined on page 3 of the SGS report.*

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
907-561-2120

Report Number: **1180214**

Client Project: **32-1-17604-4 591 W 67th Ave**

Dear Alena Voigt,

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 Jillian 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.

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

Print Date: 01/18/2018 8:41:49AM

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1180214**
Project Name/Site: **32-1-17604-4 591 W 67th Ave**
Project Contact: **Alena Voigt**

Refer to sample receipt form for information on sample condition.

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

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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, indenmification and jurisdiction issues defined therein.

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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	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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
17604-B2MW	1180214001	01/11/2018	01/12/2018	Water (Surface, Eff., Ground)
17604-B4MW	1180214002	01/11/2018	01/12/2018	Water (Surface, Eff., Ground)
17604-TB	1180214003	01/11/2018	01/12/2018	Water (Surface, Eff., Ground)

Method	Method Description
AK102	DRO Low Volume (W)
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **17604-B2MW**
Lab Sample ID: 1180214001
Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	0.305J	mg/L
Benzene	38.6	ug/L
cis-1,2-Dichloroethene	1.25	ug/L
Methyl-t-butyl ether	51.2	ug/L

Client Sample ID: **17604-B4MW**
Lab Sample ID: 1180214002
Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	0.244J	mg/L
Benzene	51.7	ug/L
cis-1,2-Dichloroethene	1.54	ug/L
Methyl-t-butyl ether	26.1	ug/L

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Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214001
Lab Project ID: 1180214

Collection Date: 01/11/18 13:05
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.305	J	0.600	0.180	mg/L	1		01/17/18 13:52
Surrogates								
5a Androstane (surr)	89.6		50-150		%	1		01/17/18 13:52

Batch Information

Analytical Batch: XFC14029
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/17/18 13:52
Container ID: 1180214001-D

Prep Batch: XXX38998
Prep Method: SW3520C
Prep Date/Time: 01/16/18 08:20
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 01/18/2018 8:41:53AM

J flagging is activated

Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214001
Lab Project ID: 1180214

Collection Date: 01/11/18 13:05
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		01/15/18 18:23
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:23
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		01/15/18 18:23
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:23
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:23
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:23
Benzene	38.6		0.400	0.120	ug/L	1		01/15/18 18:23
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
Bromoform	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
Bromomethane	2.50	U	5.00	1.50	ug/L	1		01/15/18 18:23
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:23
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:23
Chloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:23

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Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214001
Lab Project ID: 1180214

Collection Date: 01/11/18 13:05
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Chloromethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
cis-1,2-Dichloroethene	1.25		1.00	0.310	ug/L	1		01/15/18 18:23
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		01/15/18 18:23
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		01/15/18 18:23
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Freon-113	5.00 U		10.0	3.10	ug/L	1		01/15/18 18:23
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		01/15/18 18:23
Methyl-t-butyl ether	51.2		10.0	3.10	ug/L	1		01/15/18 18:23
Naphthalene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
o-Xylene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		01/15/18 18:23
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Styrene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Toluene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:23
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		01/15/18 18:23
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		01/15/18 18:23
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		01/15/18 18:23
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		01/15/18 18:23
4-Bromofluorobenzene (surr)	97		85-114		%	1		01/15/18 18:23
Toluene-d8 (surr)	108		89-112		%	1		01/15/18 18:23

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Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214001
Lab Project ID: 1180214

Collection Date: 01/11/18 13:05
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17551
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 01/15/18 18:23
Container ID: 1180214001-A

Prep Batch: VXX31876
Prep Method: SW5030B
Prep Date/Time: 01/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214002
Lab Project ID: 1180214

Collection Date: 01/11/18 13:15
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.244	J	0.600	0.180	mg/L	1		01/17/18 14:02
Surrogates								
5a Androstane (surr)	80.2		50-150		%	1		01/17/18 14:02

Batch Information

Analytical Batch: XFC14029
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 01/17/18 14:02
Container ID: 1180214002-D

Prep Batch: XXX38998
Prep Method: SW3520C
Prep Date/Time: 01/16/18 08:20
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 01/18/2018 8:41:53AM

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Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214002
Lab Project ID: 1180214

Collection Date: 01/11/18 13:15
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		01/15/18 18:39
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:39
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		01/15/18 18:39
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:39
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:39
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:39
Benzene	51.7		0.400	0.120	ug/L	1		01/15/18 18:39
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
Bromoform	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
Bromomethane	2.50	U	5.00	1.50	ug/L	1		01/15/18 18:39
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		01/15/18 18:39
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		01/15/18 18:39
Chloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 18:39

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Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214002
Lab Project ID: 1180214

Collection Date: 01/11/18 13:15
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Chloromethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
cis-1,2-Dichloroethene	1.54		1.00	0.310	ug/L	1		01/15/18 18:39
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		01/15/18 18:39
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		01/15/18 18:39
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Freon-113	5.00 U		10.0	3.10	ug/L	1		01/15/18 18:39
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		01/15/18 18:39
Methyl-t-butyl ether	26.1		10.0	3.10	ug/L	1		01/15/18 18:39
Naphthalene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
o-Xylene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		01/15/18 18:39
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Styrene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Toluene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		01/15/18 18:39
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		01/15/18 18:39
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		01/15/18 18:39
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		01/15/18 18:39
Surrogates								
1,2-Dichloroethane-D4 (surr)	100		81-118		%	1		01/15/18 18:39
4-Bromofluorobenzene (surr)	102		85-114		%	1		01/15/18 18:39
Toluene-d8 (surr)	109		89-112		%	1		01/15/18 18:39

Print Date: 01/18/2018 8:41:53AM

J flagging is activated

Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214002
Lab Project ID: 1180214

Collection Date: 01/11/18 13:15
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17551
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 01/15/18 18:39
Container ID: 1180214002-A

Prep Batch: VXX31876
Prep Method: SW5030B
Prep Date/Time: 01/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-TB**

Client Sample ID: **17604-TB**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214003
Lab Project ID: 1180214

Collection Date: 01/11/18 12:00
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		01/15/18 16:31
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		01/15/18 16:31
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
Benzene	0.200	U	0.400	0.120	ug/L	1		01/15/18 16:31
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
Bromoform	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Bromomethane	2.50	U	5.00	1.50	ug/L	1		01/15/18 16:31
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
Chloroethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31

Results of **17604-TB**

Client Sample ID: **17604-TB**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214003
Lab Project ID: 1180214

Collection Date: 01/11/18 12:00
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Chloromethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		01/15/18 16:31
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Freon-113	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		01/15/18 16:31
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
Naphthalene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
o-Xylene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		01/15/18 16:31
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Styrene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Toluene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		01/15/18 16:31
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		01/15/18 16:31
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		01/15/18 16:31
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		01/15/18 16:31
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		01/15/18 16:31
4-Bromofluorobenzene (surr)	99.1		85-114		%	1		01/15/18 16:31
Toluene-d8 (surr)	109		89-112		%	1		01/15/18 16:31

Print Date: 01/18/2018 8:41:53AM

J flagging is activated

Results of **17604-TB**

Client Sample ID: **17604-TB**
Client Project ID: **32-1-17604-4 591 W 67th Ave**
Lab Sample ID: 1180214003
Lab Project ID: 1180214

Collection Date: 01/11/18 12:00
Received Date: 01/12/18 10:53
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17551
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 01/15/18 16:31
Container ID: 1180214003-A

Prep Batch: VXX31876
Prep Method: SW5030B
Prep Date/Time: 01/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1774226 [VXX/31876]
Blank Lab ID: 1431800

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1180214001, 1180214002, 1180214003

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1774226 [VXX/31876]
Blank Lab ID: 1431800

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1180214001, 1180214002, 1180214003

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	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
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	98.6	85-114		%
Toluene-d8 (surr)	107	89-112		%

Method Blank

Blank ID: MB for HBN 1774226 [VXX/31876]
Blank Lab ID: 1431800

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1180214001, 1180214002, 1180214003

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17551
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 1/15/2018 2:27:00PM

Prep Batch: VXX31876
Prep Method: SW5030B
Prep Date/Time: 1/15/2018 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 01/18/2018 8:41:55AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180214 [VXX31876]
Blank Spike Lab ID: 1431801
Date Analyzed: 01/15/2018 14:43

Spike Duplicate ID: LCSD for HBN 1180214 [VXX31876]
Spike Duplicate Lab ID: 1431802
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1180214001, 1180214002, 1180214003

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	29.0	97	30	29.1	97	(78-124)	0.34	(< 20)
1,1,1-Trichloroethane	30	29.2	97	30	28.0	93	(74-131)	4.30	(< 20)
1,1,2,2-Tetrachloroethane	30	29.1	97	30	29.0	97	(71-121)	0.52	(< 20)
1,1,2-Trichloroethane	30	29.4	98	30	30.1	100	(80-119)	2.40	(< 20)
1,1-Dichloroethane	30	30.3	101	30	29.2	98	(77-125)	3.40	(< 20)
1,1-Dichloroethene	30	27.2	91	30	25.6	85	(71-131)	5.90	(< 20)
1,1-Dichloropropene	30	30.9	103	30	29.8	99	(79-125)	3.70	(< 20)
1,2,3-Trichlorobenzene	30	28.0	93	30	30.0	100	(69-129)	7.00	(< 20)
1,2,3-Trichloropropane	30	28.3	94	30	28.0	93	(73-122)	0.96	(< 20)
1,2,4-Trichlorobenzene	30	26.2	87	30	27.6	92	(69-130)	5.30	(< 20)
1,2,4-Trimethylbenzene	30	31.4	105	30	32.0	107	(79-124)	1.80	(< 20)
1,2-Dibromo-3-chloropropane	30	28.6	95	30	29.2	97	(62-128)	2.00	(< 20)
1,2-Dibromoethane	30	28.6	95	30	29.1	97	(77-121)	1.70	(< 20)
1,2-Dichlorobenzene	30	28.0	93	30	28.4	95	(80-119)	1.60	(< 20)
1,2-Dichloroethane	30	29.2	98	30	28.5	95	(73-128)	2.50	(< 20)
1,2-Dichloropropane	30	33.0	110	30	32.1	107	(78-122)	2.70	(< 20)
1,3,5-Trimethylbenzene	30	31.5	105	30	31.5	105	(75-124)	0.00	(< 20)
1,3-Dichlorobenzene	30	28.7	96	30	28.7	96	(80-119)	0.21	(< 20)
1,3-Dichloropropane	30	30.8	103	30	31.5	105	(80-119)	2.30	(< 20)
1,4-Dichlorobenzene	30	28.7	96	30	28.8	96	(79-118)	0.52	(< 20)
2,2-Dichloropropane	30	30.9	103	30	29.4	98	(60-139)	4.70	(< 20)
2-Butanone (MEK)	90	101	113	90	101	112	(56-143)	0.48	(< 20)
2-Chlorotoluene	30	31.3	104	30	30.8	103	(79-122)	1.50	(< 20)
2-Hexanone	90	105	116	90	106	118	(57-139)	1.30	(< 20)
4-Chlorotoluene	30	31.0	103	30	31.3	104	(78-122)	1.10	(< 20)
4-Isopropyltoluene	30	32.3	108	30	32.4	108	(77-127)	0.25	(< 20)
4-Methyl-2-pentanone (MIBK)	90	100	112	90	97.7	109	(67-130)	2.70	(< 20)
Benzene	30	32.0	107	30	31.3	104	(79-120)	2.10	(< 20)
Bromobenzene	30	28.9	96	30	28.9	96	(80-120)	0.00	(< 20)
Bromochloromethane	30	28.7	96	30	27.8	93	(78-123)	3.20	(< 20)
Bromodichloromethane	30	31.1	104	30	30.0	100	(79-125)	3.60	(< 20)
Bromoform	30	29.6	99	30	29.9	100	(66-130)	1.10	(< 20)
Bromomethane	30	26.1	87	30	25.1	84	(53-141)	3.90	(< 20)
Carbon disulfide	45	38.1	85	45	36.1	80	(64-133)	5.40	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180214 [VXX31876]
Blank Spike Lab ID: 1431801
Date Analyzed: 01/15/2018 14:43

Spike Duplicate ID: LCSD for HBN 1180214 [VXX31876]
Spike Duplicate Lab ID: 1431802
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1180214001, 1180214002, 1180214003

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	29.0	97	30	27.7	92	(72-136)	4.50	(< 20)
Chlorobenzene	30	29.6	99	30	29.5	98	(82-118)	0.24	(< 20)
Chloroethane	30	32.2	107	30	29.4	98	(60-138)	9.10	(< 20)
Chloroform	30	28.9	96	30	28.1	94	(79-124)	2.80	(< 20)
Chloromethane	30	29.6	99	30	28.0	93	(50-139)	5.70	(< 20)
cis-1,2-Dichloroethene	30	29.1	97	30	27.7	92	(78-123)	4.90	(< 20)
cis-1,3-Dichloropropene	30	32.6	109	30	31.8	106	(75-124)	2.60	(< 20)
Dibromochloromethane	30	29.7	99	30	29.9	100	(74-126)	0.84	(< 20)
Dibromomethane	30	29.4	98	30	28.6	95	(79-123)	2.90	(< 20)
Dichlorodifluoromethane	30	24.6	82	30	22.9	76	(32-152)	7.00	(< 20)
Ethylbenzene	30	32.5	108	30	32.7	109	(79-121)	0.86	(< 20)
Freon-113	45	42.6	95	45	40.4	90	(70-136)	5.40	(< 20)
Hexachlorobutadiene	30	28.4	95	30	30.2	101	(66-134)	6.40	(< 20)
Isopropylbenzene (Cumene)	30	31.5	105	30	32.0	107	(72-131)	1.70	(< 20)
Methylene chloride	30	28.6	95	30	27.6	92	(74-124)	3.40	(< 20)
Methyl-t-butyl ether	45	48.5	108	45	47.6	106	(71-124)	1.80	(< 20)
Naphthalene	30	29.2	97	30	31.7	106	(61-128)	8.20	(< 20)
n-Butylbenzene	30	31.5	105	30	32.3	108	(75-128)	2.40	(< 20)
n-Propylbenzene	30	31.4	105	30	31.6	105	(76-126)	0.79	(< 20)
o-Xylene	30	31.9	106	30	32.3	108	(78-122)	1.20	(< 20)
P & M -Xylene	60	64.8	108	60	64.3	107	(80-121)	0.85	(< 20)
sec-Butylbenzene	30	32.0	107	30	32.2	107	(77-126)	0.90	(< 20)
Styrene	30	32.2	107	30	32.6	109	(78-123)	1.40	(< 20)
tert-Butylbenzene	30	31.9	106	30	31.7	106	(78-124)	0.60	(< 20)
Tetrachloroethene	30	28.0	93	30	28.0	93	(74-129)	0.11	(< 20)
Toluene	30	29.7	99	30	29.7	99	(80-121)	0.24	(< 20)
trans-1,2-Dichloroethene	30	28.0	93	30	26.8	89	(75-124)	4.20	(< 20)
trans-1,3-Dichloropropene	30	31.8	106	30	32.6	109	(73-127)	2.50	(< 20)
Trichloroethene	30	29.7	99	30	28.9	96	(79-123)	2.70	(< 20)
Trichlorofluoromethane	30	30.0	100	30	28.0	93	(65-141)	6.90	(< 20)
Vinyl acetate	30	37.4	125	30	36.8	123	(54-146)	1.50	(< 20)
Vinyl chloride	30	30.1	100	30	28.5	95	(58-137)	5.70	(< 20)
Xylenes (total)	90	96.7	107	90	96.6	107	(79-121)	0.18	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1180214 [VXX31876]
Blank Spike Lab ID: 1431801
Date Analyzed: 01/15/2018 14:43

Spike Duplicate ID: LCSD for HBN 1180214 [VXX31876]
Spike Duplicate Lab ID: 1431802
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1180214001, 1180214002, 1180214003

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98.5	99	30	95.1	95	(81-118)	3.50	
4-Bromofluorobenzene (surr)	30	98.4	98	30	97.3	97	(85-114)	1.20	
Toluene-d8 (surr)	30	108	108	30	108	108	(89-112)	0.34	

Batch Information

Analytical Batch: **VMS17551**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **FDR**

Prep Batch: **VXX31876**
Prep Method: **SW5030B**
Prep Date/Time: **01/15/2018 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1774209 [XXX/38998]
Blank Lab ID: 1431728

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1180214001, 1180214002

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	93.8	60-120		%

Batch Information

Analytical Batch: XFC14029
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 1/17/2018 12:24:00PM

Prep Batch: XXX38998
Prep Method: SW3520C
Prep Date/Time: 1/16/2018 8:20:32AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1180214 [XXX38998]
Blank Spike Lab ID: 1431729
Date Analyzed: 01/17/2018 12:34

Spike Duplicate ID: LCSD for HBN 1180214 [XXX38998]
Spike Duplicate Lab ID: 1431730
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1180214001, 1180214002

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	21.8	109	20	21.9	109	(75-125)	0.47	(< 20)
Surrogates									
5a Androstane (surr)	0.4	102	102	0.4	105	105	(60-120)	2.50	

Batch Information

Analytical Batch: **XFC14029**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX38998**
Prep Method: **SW3520C**
Prep Date/Time: **01/16/2018 08:20**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

1180214

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

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

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

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

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

CHAIN-OF-CUSTODY RECORD

Laboratory SGS Page 1 of 1
Attn: Jillian V.

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	VOCs/ 8260C	DRO/ AK102					Total Number of Containers	Remarks/Matrix
17604-B2MW	(1) A-E	13:05	1/11/18		✓	✓	✓					5	Groundwater
17604-B4MW	(2) A-E	13:15	1/11/18		✓	✓	✓					5	Groundwater
17604-TB	(3) A-C	12:00	1/11/18			✓						1Box	Lab Supplied TB

Project Information	Sample Receipt
Project Number: 32-1-17604-4	Total Number of Containers:
Project Name: 591 W. 67th AVE	COC Seals/Intact? Y/N/NA: (NA)
Contact: JHT, ADV	Received Good Cond./Cold: 1.1
Ongoing Project? Yes ☑ No ☐	Delivery Method: Hand Delivered #040
Sampler: ADV	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: STANDARD
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Alena Voigt Time: 10:53	Signature: Time:	Signature: Time:
Printed Name: Alena Voigt Date: 1/12/18	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 10:53
Printed Name: Date:	Printed Name: Date:	Printed Name: Nicholas Wells Date: 1/12/18
Company:	Company:	Company: SGS

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

25 of 27

F-19-91/UR

No. 35299

e-Sample Receipt Form

SGS Workorder #: **1180214**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	ABSENT
COC accompanied samples?	yes	
n/a **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 @ 1.1 °C Therm. ID: D40
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	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	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	yes	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1180214001-A	HCL to pH < 2	OK			
1180214001-B	HCL to pH < 2	OK			
1180214001-C	HCL to pH < 2	OK			
1180214001-D	HCL to pH < 2	OK			
1180214001-E	HCL to pH < 2	OK			
1180214002-A	HCL to pH < 2	OK			
1180214002-B	HCL to pH < 2	OK			
1180214002-C	HCL to pH < 2	OK			
1180214002-D	HCL to pH < 2	OK			
1180214002-E	HCL to pH < 2	OK			
1180214003-A	HCL to pH < 2	OK			
1180214003-B	HCL to pH < 2	OK			
1180214003-C	HCL to pH < 2	OK			

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
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.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: Additional Site Characterization Activities, 3000 Arctic Boulevard, Anchorage, Alaska

Date: August 2018

Laboratory Report Date: January 19, 2018

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Jessa Tibbetts
Title: Environmental Scientist
Laboratory Name: SGS North America Inc.
Work Order Number: 1180214
ADEC File Number: 2100.26.314

(**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 (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
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 (Please explain.)
Comments**:**

b. Correct analyses requested? **Yes / No / *NA* (Please explain.)**
Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (6° ± 0° C)?
Yes / No / NA (Please explain.)
Comments: *The temperature blank was documented as 1.1° C.*

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

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

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments: *Discrepancies were not noted by the laboratory*

e. Data quality or usability affected? **Yes / No (Please Explain.)**
Comments: *Data quality/usability is unaffected.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments: *No discrepancies were noted.*

c. Were corrective actions documented? **Yes / No / NA (Please explain.)**
Comments:

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The case narrative does not discuss data quality/usability.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA (Please explain.)**
Comments:

b. All applicable holding times met? **Yes / No / NA (Please explain.)**
Comments:

c. All soils reported on a dry-weight basis? **Yes / No / NA (Please explain.)**
Comments: *Soil samples were not analyzed as part of this work order.*

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA (Please explain.)**
Comments*: The LOQ for 1,2,3-trichloropropane is greater than the respective ADEC Table C groundwater cleanup levels.*

e. Data quality or usability affected? **(Please explain.)**
Comments: *The data cannot be used to determine whether or not concentrations of 1,2,3-trichloropropane is present at concentrations greater than the respective ADEC Table C groundwater cleanup levels but less than the LOQ.*

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

iii. If above LOQ, what samples are affected? ***NA***
Comments:

iv. Do the affected sample(s) have data flags? **Yes / No / NA**
Comments:
If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

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

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments: *Only organic analyses were requested with this work order.*

iii. Accuracy – All percent recoveries (%R) reported *and w*ithin method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

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

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

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

vii. Data quality or usability affected? Explain.
Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes / No / NA (Please explain.)**
Comments:

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

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain.
Comments:

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

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)** Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**
Comments: *The project sample and trip blank were transported in one cooler.*

iii. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

iv. If above LOQ, what samples are affected?
Comments**:**

v. Data quality or usability affected? Explain.
Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples? **Yes / No / NA (Please explain.)**
Comments: *Sample B4MW is a duplicate of Sample B2MW.*

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) **Yes / No / NA (Please explain.)**
Comments: *The methyl-t-butyl ether (64.94%) RPD is above DQO and flagged "E" in Table 4.*

iv. Data quality or usability affected? Explain.
Comments: *Methyl-t-butyl ether was detected in both the primary and duplicate samples at concentrations less than the applicable ADEC cleanup levels; therefore, the data are acceptable for the purposes of this report.*

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
Yes / No / NA (Please explain.) *Decontamination and equipment blanks were not included in our ADEC-approved Work Plan.*

i. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

ii. If results are above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Explain. ***NA***
Comments:

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

a. Are they defined and appropriate? **Yes / No / NA**
Comments: *Laboratory-specific flags are defined on page 3 of the SGS report.*

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
907-561-2120

Report Number: **1182363**

Client Project: **32-1-17604-004 Warning Lights**

Dear Alena Voigt,

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 Jillian 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.

_____

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

Print Date: 05/31/2018 8:26:09AM

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1182363**
Project Name/Site: **32-1-17604-004 Warning Lights**
Project Contact: **Alena Voigt**

Refer to sample receipt form for information on sample condition.

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

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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, indenmification 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, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
17604-B1MW	1182363001	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)
17604-B2MW	1182363002	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)
17604-B3MW	1182363003	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)
17604-B4MW	1182363004	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)
17604-B5MW	1182363005	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)
17604-B6MW	1182363006	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)
17604-TB	1182363007	05/22/2018	05/23/2018	Water (Surface, Eff., Ground)

Method	Method Description
AK102	DRO Low Volume (W)
SW8260C	Volatile Organic Compounds (W) FULL

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **17604-B1MW**
Lab Sample ID: 1182363001
Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	0.709	mg/L
Toluene	0.340J	ug/L

Client Sample ID: **17604-B2MW**
Lab Sample ID: 1182363002
Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	0.289J	mg/L
Benzene	42.9	ug/L
cis-1,2-Dichloroethene	1.26	ug/L
Methyl-t-butyl ether	5.77J	ug/L

Client Sample ID: **17604-B3MW**
Lab Sample ID: 1182363003
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	0.581	mg/L

Client Sample ID: **17604-B4MW**
Lab Sample ID: 1182363004
Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	0.529J	mg/L
Benzene	43.7	ug/L
cis-1,2-Dichloroethene	1.25	ug/L
Methyl-t-butyl ether	5.45J	ug/L

Client Sample ID: **17604-B5MW**
Lab Sample ID: 1182363005
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	0.266J	mg/L

Client Sample ID: **17604-B6MW**
Lab Sample ID: 1182363006
Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	0.544J	mg/L
Benzene	17.4	ug/L
cis-1,2-Dichloroethene	2.09	ug/L
Methyl-t-butyl ether	54.8	ug/L

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Results of **17604-B1MW**

Client Sample ID: **17604-B1MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363001
Lab Project ID: 1182363

Collection Date: 05/22/18 14:15
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.709		0.588	0.176	mg/L	1		05/30/18 01:43
Surrogates								
5a Androstane (surr)	78.9		50-150		%	1		05/30/18 01:43

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 05/30/18 01:43
Container ID: 1182363001-A

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 05/29/18 08:14
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of **17604-B1MW**

Client Sample ID: **17604-B1MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363001
Lab Project ID: 1182363

Collection Date: 05/22/18 14:15
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		05/24/18 18:31
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:31
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		05/24/18 18:31
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:31
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:31
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:31
Benzene	0.200	U	0.400	0.120	ug/L	1		05/24/18 18:31
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
Bromoform	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
Bromomethane	2.50	U	5.00	1.50	ug/L	1		05/24/18 18:31
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:31
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:31
Chloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:31

Results of **17604-B1MW**

Client Sample ID: **17604-B1MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363001
Lab Project ID: 1182363

Collection Date: 05/22/18 14:15
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 18:31
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 18:31
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 18:31
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 18:31
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		05/24/18 18:31
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 18:31
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Toluene	0.340 J		1.00	0.310	ug/L	1		05/24/18 18:31
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:31
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 18:31
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 18:31
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 18:31
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		05/24/18 18:31
4-Bromofluorobenzene (surr)	101		85-114		%	1		05/24/18 18:31
Toluene-d8 (surr)	98.1		89-112		%	1		05/24/18 18:31

Print Date: 05/31/2018 8:26:15AM

J flagging is activated

Results of **17604-B1MW**

Client Sample ID: **17604-B1MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363001
Lab Project ID: 1182363

Collection Date: 05/22/18 14:15
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 18:31
Container ID: 1182363001-C

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363002
Lab Project ID: 1182363

Collection Date: 05/22/18 12:45
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.289	J	0.577	0.173	mg/L	1		05/30/18 01:53
Surrogates								
5a Androstane (surr)	75.2		50-150		%	1		05/30/18 01:53

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 05/30/18 01:53
Container ID: 1182363002-A

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 05/29/18 08:14
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363002
Lab Project ID: 1182363

Collection Date: 05/22/18 12:45
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		05/24/18 18:48
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:48
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		05/24/18 18:48
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:48
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:48
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:48
Benzene	42.9		0.400	0.120	ug/L	1		05/24/18 18:48
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
Bromoform	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
Bromomethane	2.50	U	5.00	1.50	ug/L	1		05/24/18 18:48
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		05/24/18 18:48
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 18:48
Chloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 18:48

Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363002
Lab Project ID: 1182363

Collection Date: 05/22/18 12:45
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
cis-1,2-Dichloroethene	1.26		1.00	0.310	ug/L	1		05/24/18 18:48
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 18:48
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 18:48
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 18:48
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 18:48
Methyl-t-butyl ether	5.77 J		10.0	3.10	ug/L	1		05/24/18 18:48
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 18:48
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Toluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 18:48
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 18:48
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 18:48
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 18:48
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		05/24/18 18:48
4-Bromofluorobenzene (surr)	101		85-114		%	1		05/24/18 18:48
Toluene-d8 (surr)	97.8		89-112		%	1		05/24/18 18:48

Results of **17604-B2MW**

Client Sample ID: **17604-B2MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363002
Lab Project ID: 1182363

Collection Date: 05/22/18 12:45
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 18:48
Container ID: 1182363002-C

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-B3MW**

Client Sample ID: **17604-B3MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363003
Lab Project ID: 1182363

Collection Date: 05/22/18 15:55
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.581		0.577	0.173	mg/L	1		05/30/18 02:03
Surrogates								
5a Androstane (surr)	77.3		50-150		%	1		05/30/18 02:03

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 05/30/18 02:03
Container ID: 1182363003-A

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 05/29/18 08:14
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **17604-B3MW**

Client Sample ID: **17604-B3MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363003
Lab Project ID: 1182363

Collection Date: 05/22/18 15:55
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
1,1,1-Trichloroethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,1,2,2-Tetrachloroethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
1,1,2-Trichloroethane	0.200 U		0.400	0.120	ug/L	1		05/24/18 19:05
1,1-Dichloroethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,1-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,1-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,2,3-Trichlorobenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,2,3-Trichloropropane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,2,4-Trichlorobenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,2-Dibromo-3-chloropropane	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		05/24/18 19:05
1,2-Dichlorobenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
1,2-Dichloropropane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,3-Dichlorobenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
1,3-Dichloropropane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
1,4-Dichlorobenzene	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
2,2-Dichloropropane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
2-Butanone (MEK)	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
2-Chlorotoluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
2-Hexanone	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
4-Chlorotoluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
4-Isopropyltoluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
4-Methyl-2-pentanone (MIBK)	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
Benzene	0.200 U		0.400	0.120	ug/L	1		05/24/18 19:05
Bromobenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Bromochloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Bromodichloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
Bromoform	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Bromomethane	2.50 U		5.00	1.50	ug/L	1		05/24/18 19:05
Carbon disulfide	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
Carbon tetrachloride	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Chlorobenzene	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
Chloroethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05

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J flagging is activated

Results of **17604-B3MW**

Client Sample ID: **17604-B3MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363003
Lab Project ID: 1182363

Collection Date: 05/22/18 15:55
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:05
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 19:05
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 19:05
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Toluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:05
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:05
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 19:05
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 19:05
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		05/24/18 19:05
4-Bromofluorobenzene (surr)	99.9		85-114		%	1		05/24/18 19:05
Toluene-d8 (surr)	98.7		89-112		%	1		05/24/18 19:05

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J flagging is activated

Results of **17604-B3MW**

Client Sample ID: **17604-B3MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363003
Lab Project ID: 1182363

Collection Date: 05/22/18 15:55
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 19:05
Container ID: 1182363003-C

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363004
Lab Project ID: 1182363

Collection Date: 05/22/18 13:00
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.529	J	0.577	0.173	mg/L	1		05/30/18 02:13
Surrogates								
5a Androstane (surr)	90.4		50-150		%	1		05/30/18 02:13

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 05/30/18 02:13
Container ID: 1182363004-A

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 05/29/18 08:14
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363004
Lab Project ID: 1182363

Collection Date: 05/22/18 13:00
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		05/24/18 19:22
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:22
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		05/24/18 19:22
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:22
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:22
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:22
Benzene	43.7		0.400	0.120	ug/L	1		05/24/18 19:22
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
Bromoform	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
Bromomethane	2.50	U	5.00	1.50	ug/L	1		05/24/18 19:22
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:22
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:22
Chloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:22

Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363004
Lab Project ID: 1182363

Collection Date: 05/22/18 13:00
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
cis-1,2-Dichloroethene	1.25		1.00	0.310	ug/L	1		05/24/18 19:22
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:22
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:22
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:22
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 19:22
Methyl-t-butyl ether	5.45 J		10.0	3.10	ug/L	1		05/24/18 19:22
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 19:22
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Toluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:22
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:22
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 19:22
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 19:22
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		05/24/18 19:22
4-Bromofluorobenzene (surr)	101		85-114		%	1		05/24/18 19:22
Toluene-d8 (surr)	98.1		89-112		%	1		05/24/18 19:22

Print Date: 05/31/2018 8:26:15AM

J flagging is activated

Results of **17604-B4MW**

Client Sample ID: **17604-B4MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363004
Lab Project ID: 1182363

Collection Date: 05/22/18 13:00
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 19:22
Container ID: 1182363004-C

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-B5MW**

Client Sample ID: **17604-B5MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363005
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.266	J	0.605	0.181	mg/L	1		05/30/18 02:22
Surrogates								
5a Androstane (surr)	79.7		50-150		%	1		05/30/18 02:22

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 05/30/18 02:22
Container ID: 1182363005-A

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 05/29/18 08:14
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Results of **17604-B5MW**

Client Sample ID: **17604-B5MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363005
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		05/24/18 19:38
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:38
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		05/24/18 19:38
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:38
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:38
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:38
Benzene	0.200	U	0.400	0.120	ug/L	1		05/24/18 19:38
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
Bromoform	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
Bromomethane	2.50	U	5.00	1.50	ug/L	1		05/24/18 19:38
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:38
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:38
Chloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:38

Print Date: 05/31/2018 8:26:15AM

J flagging is activated

Results of **17604-B5MW**

Client Sample ID: **17604-B5MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363005
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:38
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:38
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:38
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 19:38
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:38
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 19:38
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Toluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:38
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:38
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 19:38
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 19:38
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		05/24/18 19:38
4-Bromofluorobenzene (surr)	102		85-114		%	1		05/24/18 19:38
Toluene-d8 (surr)	98.4		89-112		%	1		05/24/18 19:38

Results of **17604-B5MW**

Client Sample ID: **17604-B5MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363005
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 19:38
Container ID: 1182363005-C

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-B6MW**

Client Sample ID: **17604-B6MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363006
Lab Project ID: 1182363

Collection Date: 05/22/18 10:50
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.544	J	0.588	0.176	mg/L	1		05/30/18 02:32
Surrogates								
5a Androstane (surr)	80.7		50-150		%	1		05/30/18 02:32

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 05/30/18 02:32
Container ID: 1182363006-A

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 05/29/18 08:14
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of **17604-B6MW**

Client Sample ID: **17604-B6MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363006
Lab Project ID: 1182363

Collection Date: 05/22/18 10:50
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		05/24/18 19:55
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:55
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		05/24/18 19:55
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:55
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:55
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:55
Benzene	17.4		0.400	0.120	ug/L	1		05/24/18 19:55
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
Bromoform	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
Bromomethane	2.50	U	5.00	1.50	ug/L	1		05/24/18 19:55
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		05/24/18 19:55
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 19:55
Chloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 19:55

Results of **17604-B6MW**

Client Sample ID: **17604-B6MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363006
Lab Project ID: 1182363

Collection Date: 05/22/18 10:50
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
cis-1,2-Dichloroethene	2.09		1.00	0.310	ug/L	1		05/24/18 19:55
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:55
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 19:55
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:55
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 19:55
Methyl-t-butyl ether	54.8		10.0	3.10	ug/L	1		05/24/18 19:55
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 19:55
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Toluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 19:55
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 19:55
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 19:55
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 19:55
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		05/24/18 19:55
4-Bromofluorobenzene (surr)	102		85-114		%	1		05/24/18 19:55
Toluene-d8 (surr)	98.3		89-112		%	1		05/24/18 19:55

Results of **17604-B6MW**

Client Sample ID: **17604-B6MW**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363006
Lab Project ID: 1182363

Collection Date: 05/22/18 10:50
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 19:55
Container ID: 1182363006-C

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **17604-TB**

Client Sample ID: **17604-TB**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363007
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		05/24/18 15:42
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		05/24/18 15:42
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		05/24/18 15:42
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 15:42
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		05/24/18 15:42
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		05/24/18 15:42
Benzene	0.200	U	0.400	0.120	ug/L	1		05/24/18 15:42
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
Bromoform	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
Bromomethane	2.50	U	5.00	1.50	ug/L	1		05/24/18 15:42
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		05/24/18 15:42
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		05/24/18 15:42
Chloroethane	0.500	U	1.00	0.310	ug/L	1		05/24/18 15:42

Print Date: 05/31/2018 8:26:15AM

J flagging is activated

Results of **17604-TB**

Client Sample ID: **17604-TB**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363007
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Chloromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		05/24/18 15:42
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		05/24/18 15:42
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Freon-113	5.00 U		10.0	3.10	ug/L	1		05/24/18 15:42
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		05/24/18 15:42
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		05/24/18 15:42
Naphthalene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
o-Xylene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		05/24/18 15:42
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Styrene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Toluene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		05/24/18 15:42
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		05/24/18 15:42
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		05/24/18 15:42
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		05/24/18 15:42
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		05/24/18 15:42
4-Bromofluorobenzene (surr)	102		85-114		%	1		05/24/18 15:42
Toluene-d8 (surr)	100		89-112		%	1		05/24/18 15:42

Results of **17604-TB**

Client Sample ID: **17604-TB**
Client Project ID: **32-1-17604-004 Warning Lights**
Lab Sample ID: 1182363007
Lab Project ID: 1182363

Collection Date: 05/22/18 10:20
Received Date: 05/23/18 12:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 05/24/18 15:42
Container ID: 1182363007-A

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 05/24/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1780066 [VXX/32272]
Blank Lab ID: 1448498

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006, 1182363007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1780066 [VXX/32272]
Blank Lab ID: 1448498

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006, 1182363007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	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
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	108	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	98.2	89-112		%

Method Blank

Blank ID: MB for HBN 1780066 [VXX/32272]
Blank Lab ID: 1448498

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006, 1182363007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17812
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 5/24/2018 12:48:00PM

Prep Batch: VXX32272
Prep Method: SW5030B
Prep Date/Time: 5/24/2018 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1182363 [VXX32272]
Blank Spike Lab ID: 1448499
Date Analyzed: 05/24/2018 13:05

Spike Duplicate ID: LCSD for HBN 1182363 [VXX32272]
Spike Duplicate Lab ID: 1448500
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006, 1182363007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	30.1	100	30	30.6	102	(78-124)	1.80	(< 20)
1,1,1-Trichloroethane	30	30.8	103	30	30.1	100	(74-131)	2.10	(< 20)
1,1,2,2-Tetrachloroethane	30	29.4	98	30	29.2	97	(71-121)	0.51	(< 20)
1,1,2-Trichloroethane	30	30.0	100	30	30.2	101	(80-119)	0.57	(< 20)
1,1-Dichloroethane	30	30.2	101	30	29.6	99	(77-125)	2.20	(< 20)
1,1-Dichloroethene	30	31.0	103	30	30.8	103	(71-131)	0.68	(< 20)
1,1-Dichloropropene	30	31.2	104	30	30.6	102	(79-125)	1.70	(< 20)
1,2,3-Trichlorobenzene	30	32.1	107	30	32.9	110	(69-129)	2.40	(< 20)
1,2,3-Trichloropropane	30	28.8	96	30	28.9	96	(73-122)	0.28	(< 20)
1,2,4-Trichlorobenzene	30	32.1	107	30	32.9	110	(69-130)	2.50	(< 20)
1,2,4-Trimethylbenzene	30	32.2	107	30	31.7	106	(79-124)	1.50	(< 20)
1,2-Dibromo-3-chloropropane	30	28.9	96	30	29.1	97	(62-128)	0.86	(< 20)
1,2-Dibromoethane	30	30.2	101	30	30.8	103	(77-121)	1.90	(< 20)
1,2-Dichlorobenzene	30	30.0	100	30	30.2	101	(80-119)	0.76	(< 20)
1,2-Dichloroethane	30	30.2	101	30	29.7	99	(73-128)	1.60	(< 20)
1,2-Dichloropropane	30	31.1	104	30	30.8	103	(78-122)	1.00	(< 20)
1,3,5-Trimethylbenzene	30	31.8	106	30	31.2	104	(75-124)	1.90	(< 20)
1,3-Dichlorobenzene	30	30.8	103	30	31.1	104	(80-119)	0.87	(< 20)
1,3-Dichloropropane	30	29.9	100	30	30.2	101	(80-119)	0.83	(< 20)
1,4-Dichlorobenzene	30	31.0	103	30	30.9	103	(79-118)	0.16	(< 20)
2,2-Dichloropropane	30	32.1	107	30	31.7	106	(60-139)	1.50	(< 20)
2-Butanone (MEK)	90	84.5	94	90	84.9	94	(56-143)	0.51	(< 20)
2-Chlorotoluene	30	31.6	105	30	29.7	99	(79-122)	6.30	(< 20)
2-Hexanone	90	87.3	97	90	87.0	97	(57-139)	0.37	(< 20)
4-Chlorotoluene	30	31.5	105	30	31.0	103	(78-122)	1.60	(< 20)
4-Isopropyltoluene	30	32.4	108	30	32.4	108	(77-127)	0.12	(< 20)
4-Methyl-2-pentanone (MIBK)	90	92.5	103	90	91.7	102	(67-130)	0.96	(< 20)
Benzene	30	30.8	103	30	30.3	101	(79-120)	1.60	(< 20)
Bromobenzene	30	29.9	100	30	29.6	99	(80-120)	1.10	(< 20)
Bromochloromethane	30	31.3	104	30	32.2	107	(78-123)	2.80	(< 20)
Bromodichloromethane	30	31.0	103	30	30.6	102	(79-125)	1.60	(< 20)
Bromoform	30	29.3	98	30	29.8	99	(66-130)	1.70	(< 20)
Bromomethane	30	39.9	133	30	40.8	136	(53-141)	2.00	(< 20)
Carbon disulfide	45	45.6	101	45	46.2	103	(64-133)	1.30	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1182363 [VXX32272]
Blank Spike Lab ID: 1448499
Date Analyzed: 05/24/2018 13:05

Spike Duplicate ID: LCSD for HBN 1182363 [VXX32272]
Spike Duplicate Lab ID: 1448500
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006, 1182363007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	31.4	105	30	31.1	104	(72-136)	1.00	(< 20)
Chlorobenzene	30	28.6	95	30	28.6	95	(82-118)	0.04	(< 20)
Chloroethane	30	29.7	99	30	28.2	94	(60-138)	5.30	(< 20)
Chloroform	30	30.1	100	30	29.5	98	(79-124)	2.00	(< 20)
Chloromethane	30	32.1	107	30	33.2	111	(50-139)	3.40	(< 20)
cis-1,2-Dichloroethene	30	30.0	100	30	29.8	99	(78-123)	0.97	(< 20)
cis-1,3-Dichloropropene	30	31.6	105	30	31.5	105	(75-124)	0.29	(< 20)
Dibromochloromethane	30	30.2	101	30	30.4	101	(74-126)	0.59	(< 20)
Dibromomethane	30	30.3	101	30	30.2	101	(79-123)	0.36	(< 20)
Dichlorodifluoromethane	30	27.8	93	30	28.0	93	(32-152)	0.50	(< 20)
Ethylbenzene	30	31.2	104	30	30.7	102	(79-121)	1.50	(< 20)
Freon-113	45	48.3	107	45	47.9	107	(70-136)	0.73	(< 20)
Hexachlorobutadiene	30	32.6	109	30	32.9	110	(66-134)	0.95	(< 20)
Isopropylbenzene (Cumene)	30	31.7	106	30	30.9	103	(72-131)	2.70	(< 20)
Methylene chloride	30	29.4	98	30	29.3	98	(74-124)	0.27	(< 20)
Methyl-t-butyl ether	45	45.4	101	45	45.6	101	(71-124)	0.40	(< 20)
Naphthalene	30	30.2	101	30	31.0	103	(61-128)	2.70	(< 20)
n-Butylbenzene	30	33.1	110	30	32.9	110	(75-128)	0.58	(< 20)
n-Propylbenzene	30	31.9	106	30	31.0	103	(76-126)	2.80	(< 20)
o-Xylene	30	31.1	104	30	30.5	102	(78-122)	2.20	(< 20)
P & M -Xylene	60	62.6	104	60	62.1	104	(80-121)	0.74	(< 20)
sec-Butylbenzene	30	32.9	110	30	32.4	108	(77-126)	1.40	(< 20)
Styrene	30	32.0	107	30	31.7	106	(78-123)	0.82	(< 20)
tert-Butylbenzene	30	31.9	106	30	31.4	105	(78-124)	1.50	(< 20)
Tetrachloroethene	30	30.3	101	30	30.3	101	(74-129)	0.03	(< 20)
Toluene	30	28.7	96	30	28.8	96	(80-121)	0.21	(< 20)
trans-1,2-Dichloroethene	30	29.9	100	30	29.7	99	(75-124)	0.67	(< 20)
trans-1,3-Dichloropropene	30	31.4	105	30	31.8	106	(73-127)	1.40	(< 20)
Trichloroethene	30	30.5	102	30	29.8	99	(79-123)	2.40	(< 20)
Trichlorofluoromethane	30	30.9	103	30	31.0	103	(65-141)	0.29	(< 20)
Vinyl acetate	30	31.3	104	30	31.6	105	(54-146)	0.73	(< 20)
Vinyl chloride	30	30.0	100	30	30.6	102	(58-137)	1.70	(< 20)
Xylenes (total)	90	93.7	104	90	92.6	103	(79-121)	1.20	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1182363 [VXX32272]
Blank Spike Lab ID: 1448499
Date Analyzed: 05/24/2018 13:05

Spike Duplicate ID: LCSD for HBN 1182363 [VXX32272]
Spike Duplicate Lab ID: 1448500
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006, 1182363007

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)				
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98.3	98	30	97.7	98	(81-118)	0.68	
4-Bromofluorobenzene (surr)	30	99.8	100	30	98.7	99	(85-114)	1.10	
Toluene-d8 (surr)	30	98	98	30	99.3	99	(89-112)	1.40	

Batch Information

Analytical Batch: **VMS17812**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **FDR**

Prep Batch: **VXX32272**
Prep Method: **SW5030B**
Prep Date/Time: **05/24/2018 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1780117 [XXX/39571]
Blank Lab ID: 1448763

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.217J	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	84.1	60-120		%

Batch Information

Analytical Batch: XFC14235
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: VDL
Analytical Date/Time: 5/30/2018 12:44:00AM

Prep Batch: XXX39571
Prep Method: SW3520C
Prep Date/Time: 5/29/2018 8:14:05AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1182363 [XXX39571]
Blank Spike Lab ID: 1448764
Date Analyzed: 05/30/2018 00:54

Spike Duplicate ID: LCSD for HBN 1182363 [XXX39571]
Spike Duplicate Lab ID: 1448765
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1182363001, 1182363002, 1182363003, 1182363004, 1182363005, 1182363006

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	20.9	105	20	17.9	90	(75-125)	15.40	(< 20)
Surrogates									
5a Androstane (surr)	0.4	111	111	0.4	95.4	95	(60-120)	15.00	

Batch Information

Analytical Batch: **XFC14235**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **VDL**

Prep Batch: **XXX39571**
Prep Method: **SW3520C**
Prep Date/Time: **05/29/2018 08:14**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

1182363

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

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

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

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

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

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

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

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

Laboratory SGS Page 1 of 1
Attn: JILLIAN V.

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRO/AK102	VOCs/EPA 8260C					Total Number of Containers	Remarks/Matrix
17604-B1MW	①A-E	14:15	5/22/18		✓	✓	✓					5	Groundwater
B2MW	②A-E	12:45			✓	✓	✓						
B3MW	③A-E	15:55			✓	✓	✓						
B4MW	④A-E	13:00			✓	✓	✓						
B5MW	⑤A-E	10:20			✓	✓	✓						
B6MW	⑥A-E	10:50			✓	✓	✓						
TB	⑦A-C	16:00					✓					1 Box	Lab Supplied TB

Project Information		Sample Receipt	
Project Number:	32-1-17604-004	Total Number of Containers	
Project Name:	Waining Lights	COC Seals/Intact? Y/N/NA	
Contact:	JHT; ADV	Received Good Cond./Cold	
Ongoing Project?	Yes ☑ No ☐	Delivery Method:	
Sampler:	ADV	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	STANDARD
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Alena Voigt Time: 12:25	Signature: Time:	Signature: Time:
Printed Name: Alena Voigt Date: 5/23/18	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 12:25
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 05/23/18
Company:	Company:	Company: SGS

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

F-19-91/UR

CS: Absent (HR)
TB: 1.8 D40

No. 35444

e-Sample Receipt Form

SGS Workorder #: **1182363**

1 1 8 2 3 6 3

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	Hand-delivered
COC accompanied samples?	yes	
n/a **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 @ 1.8 °C Therm. ID: D40
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	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	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	yes	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1182363001-A	HCL to pH < 2	OK			
1182363001-B	HCL to pH < 2	OK			
1182363001-C	HCL to pH < 2	OK			
1182363001-D	HCL to pH < 2	OK			
1182363001-E	HCL to pH < 2	OK			
1182363002-A	HCL to pH < 2	OK			
1182363002-B	HCL to pH < 2	OK			
1182363002-C	HCL to pH < 2	OK			
1182363002-D	HCL to pH < 2	OK			
1182363002-E	HCL to pH < 2	OK			
1182363003-A	HCL to pH < 2	OK			
1182363003-B	HCL to pH < 2	OK			
1182363003-C	HCL to pH < 2	OK			
1182363003-D	HCL to pH < 2	OK			
1182363003-E	HCL to pH < 2	OK			
1182363004-A	HCL to pH < 2	OK			
1182363004-B	HCL to pH < 2	OK			
1182363004-C	HCL to pH < 2	OK			
1182363004-D	HCL to pH < 2	OK			
1182363004-E	HCL to pH < 2	OK			
1182363005-A	HCL to pH < 2	OK			
1182363005-B	HCL to pH < 2	OK			
1182363005-C	HCL to pH < 2	OK			
1182363005-D	HCL to pH < 2	OK			
1182363005-E	HCL to pH < 2	OK			
1182363006-A	HCL to pH < 2	OK			
1182363006-B	HCL to pH < 2	OK			
1182363006-C	HCL to pH < 2	OK			
1182363006-D	HCL to pH < 2	OK			
1182363006-E	HCL to pH < 2	OK			
1182363007-A	HCL to pH < 2	OK			
1182363007-B	HCL to pH < 2	OK			
1182363007-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 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.
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.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: Additional Site Characterization Activities, 3000 Arctic Boulevard, Anchorage, Alaska

Date: August 2018

Laboratory Report Date: May 31, 2018

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Jessa Tibbetts
Title: Environmental Scientist
Laboratory Name: SGS North America Inc.
Work Order Number: 1182363
ADEC File Number: 2100.26.314

(**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 (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
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 (Please explain.)
Comments**:**

b. Correct analyses requested? **Yes / No / *NA* (Please explain.)**
Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (6° ± 0° C)?
Yes / No / NA (Please explain.)
Comments: *The temperature blank was documented as 1.8° C.*

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

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

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments: *Discrepancies were not noted by the laboratory*

e. Data quality or usability affected? **Yes / No (Please Explain.)**
Comments: *Data quality/usability is unaffected.*

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments: *No discrepancies were noted.*

c. Were corrective actions documented? **Yes / No / NA (Please explain.)**
Comments:

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

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA (Please explain.)**
Comments:

b. All applicable holding times met? **Yes / No / NA (Please explain.)**
Comments:

c. All soils reported on a dry-weight basis? **Yes / No / NA (Please explain.)**
Comments: *Soil samples were not analyzed as part of this work order.*

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA (Please explain.)**
Comments*: The LOQ for 1,2,3-trichloropropane is greater than the respective ADEC Table C groundwater cleanup levels.*

e. Data quality or usability affected? **(Please explain.)**
Comments: *The data cannot be used to determine whether or not concentrations of 1,2,3-trichloropropane is present at concentrations greater than the respective ADEC Table C groundwater cleanup levels but less than the LOQ.*

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA (Please explain.)**
Comments: *However, an estimated concentration of DRO (217 µg/L) was detected in the method blank associated with the project samples.*

iii. If above LOQ, what samples are affected?
Comments: All *project samples are potentially affected.*

iv. Do the affected sample(s) have data flags? **Yes / No / NA**
Comments: *The reported DRO concentrations in Samples B1MW and B3MW are greater than the LOQ and less than 5x the method blank concentration. For consistency with historical results, these results are reported at the detected sample concentration and are "B" flagged on Tables 4 and 5.*

DRO was detected in Samples B2MW, B4MW, B5MW, and B6MW at estimated concentrations. These results are consistent with previous results; therefore, the DRO results are reported at the estimated concentrations 'B' flagged in Tables 4 and 5.

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

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments: *Only organic analyses were requested with this work order.*

iii. Accuracy – All percent recoveries (%R) reported *and w*ithin method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

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

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

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

vii. Data quality or usability affected? Explain.
Comments:

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes / No / NA (Please explain.)**
Comments:

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

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain.
Comments:

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

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)** Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**
Comments: *The project sample and trip blank were transported in one cooler.*

iii. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

iv. If above LOQ, what samples are affected?
Comments**:**

v. Data quality or usability affected? Explain.
Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples? **Yes / No / NA (Please explain.)**
Comments: *Sample B4MW is a duplicate of Sample B2MW.*

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments:

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

iv. Data quality or usability affected? Explain.
Comments:

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
Yes / No / NA (Please explain.) *Decontamination and equipment blanks were not included in our ADEC-approved Work Plan.*

i. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

ii. If results are above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Explain. ***NA***
Comments:

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

a. Are they defined and appropriate? **Yes / No / NA**
Comments: *Laboratory-specific flags are defined on page 3 of the SGS report.*

APPENDIX E

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 32-1-17604-004

Date: August 2018
To: Warning Lites of Alaska
Warning Lites of Alaska, 591 West 67th Ave, Anchorage AK

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