Free-Phase Product, Groundwater, and Surface Water Monitoring
Eskimo Creek – Eddie's Fireplace Inn
King Salmon, Alaska

August 2014

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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32-1-16631-011

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
Btoc	Below Top of Casing
DQO	Data Quality Objective
DRO	Diesel Range Organics
Emerald	Emerald Alaska of Anchorage, Alaska
EPA	Environmental Protection Agency
GPS	Global Positioning System
GRO	Gasoline Range Organics
IDW	Investigation Derived Waste
IRA	Interim Remedial Action
LCS	Laboratory Control Sample
LDRC	Laboratory Data Review Checklist
mg/L	Milligrams Per Liter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSL	Mean Sea Level
NTU	Nephelometric Turbidity Unit
ODW	Orin D. Williams & Son Construction
PAH	Polycyclic Aromatic Hydrocarbon
RPD	Relative Percent Difference
RRO	Residual Range Organics
SGS	SGS North America Inc. of Anchorage, Alaska
TAqH	Total Aqueous Hydrocarbon
TAH	Total Aromatic Hydrocarbon
µg/L	Micrograms Per Liter
UST	Underground Storage Tank
USGS	United States Geological Survey

FREE-PHASE PRODUCT, GROUNDWATER, AND SURFACE WATER MONITORING ESKIMO CREEK – EDDIE'S FIREPLACE INN KING SALMON, ALASKA

1.0 INTRODUCTION

This report presents the results of Shannon & Wilson's free-phase product, groundwater, and surface water monitoring activities at the Eskimo Creek – Eddie's Fireplace Inn site located in King Salmon, Alaska. The project's purpose is to protect water quality in Eskimo Creek by monitoring free-phase product migration toward the creek and accumulation of free-phase product in the interceptor trench positioned upgradient and adjacent to the creek.

This work was conducted under Shannon & Wilson's Alaska Department of Environmental Conservation (ADEC) Term Contract, Division of Spill Prevention and Response No. 18-8036-03. Notice to Proceed (NTP) No. 18-8036-03-002B was received on November 15, 2013 and NTP No. 18-8036-03-002C was received on June 5, 2014.

2.0 SITE AND PROJECT DESCRIPTION

2.1 Site Location

The project site is located adjacent to Eskimo Creek in King Salmon, Alaska. United States Geological Survey (USGS) Naknek C-2 and C-3 maps show the site is located in the Southwest 1/4 of Section 2, Range 47 West, Township 17 North, Seward Meridian. This portion of Eskimo Creek and Eddie's Fireplace Inn are situated across from the King Salmon Airport at Tract B of the Oaks Subdivision, U.S. Survey No. 4688. A vicinity map showing the approximate site location is included as Figure 1.

Eddie's Fireplace Inn is located at the top of a flat-lying bluff east of Eskimo Creek. Eskimo Creek flows in a southward direction at an elevation about 25 feet below the top of the bluff and is approximately 10 to 12 feet wide. The creek is tidally influenced, and supports wildlife and anadromous (spawning) fish. A small, flat bank exists to the east of the creek. Product seeps have been noted in the creek bank since about 1994. It is postulated that the seep consists of heating oil associated with a former underground storage tank (UST) at Eddie's Fireplace Inn. The approximate seep locations and the location of the former heating oil UST are shown on Figure 2.

2.2 Background

In 1994, free-phase product was observed emanating from the west bank of the Eddie's Fireplace Inn property (east bank of Eskimo Creek) to the surface of Eskimo Creek. Various investigations indicated that the source of the fuel release was an UST connected to Eddie's Fireplace Inn. The UST was removed in 1995.

Under an ADEC contract, Hart Crowser performed two site assessments at the project site, as detailed in their July 29, 1999 and December 10, 1999, *Eskimo Creek Assessment* reports. In June 1999, Hart Crowser advanced four soil borings in the vicinity of Eddie's Fireplace Inn that were completed as Monitoring Wells MW-1 through MW-4. In addition, Well Points WP-1 through WP-4 were installed along the base of the bluff between Eddie's Fireplace Inn and Eskimo Creek. Hart Crowser installed two additional monitoring wells, designated MW-5 and MW-6, in November 1999. Seven 4-inch diameter recovery wells, designated R1 through R7, were installed at the site by Philip Environmental Services in September 1999. Platt Environmental monitored the recovery wells between April 2000 and October 2001. Approximate locations of the monitoring wells, well points, and recovery wells are shown in Figure 2.

In 2001, Shannon & Wilson was retained by the ADEC to perform a Phase I Interim Remedial Action (IRA) at the project site. Field work included construction of an access road and interception trench with sumps (designated Sump 1 and Sump 2) and monitoring points (designated Monitoring Points MP-1 through MP-5), excavating test pits, advancing hand borings, construction of a long-term soil storage cell, and limited impacted soil removal and storage. Following installation of the interceptor trench and associated product sumps and monitoring points, a monthly product monitoring and recovery program was initiated in December 2001. The program consisted of measuring product thickness and water levels in the sumps and collecting and disposing recoverable free-phase product.

In 2002, ADEC contracted Shannon & Wilson to implement the Phase II IRA, which included removing the highly contaminated soils from the area between the edge of Eskimo Creek and the interception trench. Following impacted soil removal efforts in October 2002, the work area was re-contoured and vegetated. Recovery Wells R1 through R3 and Well Points WP-1 and WP-2 were decommissioned. Recovery Well R4 had previously been jacked out of the ground. Additional monitoring points, designated MPA, MPB, and MPC, were installed. The contract was renewed with Shannon & Wilson in July 2003 for remediation of the approximately 100 cubic yards of contaminated soil generated during the Phase I and II IRAs.

During the 2002 through 2013 period, Shannon & Wilson sampled the existing groundwater monitoring wells, collected surface water samples from Eskimo Creek, sampled the on-site drinking water well, periodically monitored and recovered free-phase product from the interception trench and recovery wells, and disposed the recovered product and investigation derived wastes (IDW). As of August 2014, approximately 95 gallons of product have been recovered from the sumps and disposed by Shannon & Wilson or recycled/re-used by our subcontractor. Measurable product (0.1 inch or greater) was observed in only Sump 1 and Monitoring Points MP1 and MP2 in 2011 and 2012. Site conditions as of 2014 are shown on Figure 3.

2.3 Project Description

The objectives of this monitoring effort were to evaluate (a) the status and mobility of the free-phase product plume, (b) the mitigation efforts to prevent product from entering the creek, and (c) future work and potential remedial options to meet groundwater and surface water cleanup standards in a cost effective manner. The project included inspecting and documenting the conditions of the monitoring wells, recovery wells, monitoring points, sumps, and site vegetation; decommissioning one monitoring well and two recovery wells; repairing one monitoring well; collecting surface water samples from Eskimo Creek; collecting groundwater samples from monitoring wells, monitoring points, and sumps; laboratory analyses of surface water and groundwater samples; disposal of IDW; and producing a summary report. SGS North America Inc. (SGS) of Anchorage, Alaska analyzed the water samples. Orin D. Williams and Son (ODW) of King Salmon, Alaska, disposed of water/product collected during previous product recovery/monitoring efforts. Johnson Drilling, of Anchorage, Alaska decommissioned and repaired the monitoring wells. Emerald Alaska (Emerald) of Anchorage, Alaska disposed of the purge water and heating oil IDW. SGS, ODW, Johnson Drilling, and Emerald were subcontracted to Shannon & Wilson.

3.0 FIELD ACTIVITIES

The field activities were performed in material accordance with our proposal dated June 11, 2013 and our proposal modifications dated November 7, 2013 and May 27, 2014. Work on this project was conducted by ADEC-Qualified Persons, as defined by 18 AAC 75.990. Site photographs taken during field activities are presented in Appendix A. Field notes are provided in Appendix B.

3.1 Work Plan Variances

Variations from the work plan and their impact to data usability and/or project objectives are listed below.

- Seeps were not observed during the initial site inspection; therefore a seep water sample was not collected.
- Three surface water samples (Samples SW-1, SW-4, and SW-5) were collected from Eskimo Creek. During the initial site inspection, the area near the proposed sample location for Sample SW-3 was static, ponded water. Eskimo Creek was documented to be flowing farther to the west as shown on Figure 3. Therefore, Sample SW-5 was collected upstream of the project site within the main channel instead of Sample SW-3. Sample SW-4 was collected downstream of Sample SW-1. The three surface water samples were collected at locations spatially representative of Eskimo Creek which provide usable data to assess the impact on the creek.
- Only one groundwater sample was collected from the interceptor trench (from Sump 2), instead of three as specified in the work plan. Free-phase product was measured in Sump 1 (0.01 foot) and Monitoring Point MP1 (0.02 foot). Monitoring Points MP2 through MP5 were dry.
- Monitoring Point MPC and Sump 2 were not purged due to insufficient water column. It is possible that analytical results from these locations may not be fully representative of the surrounding aquifer formation, although no-purge sampling has shown to be effective.

3.2 Inspection of Re-Vegetated Area, Monitoring Wells and Points, and Sumps

Shannon & Wilson's field representative visually evaluated current site conditions on May 12, 2014, including the re-vegetated/stabilized area, existing monitoring wells, product recovery sumps, and monitoring points. The viability of the wells and monitoring points installed at the site are summarized in Table 1. Swing tie measurements for the wells, monitoring points, and surface water sample locations are provided in Table 2. The sumps, monitoring points, and monitoring wells that were present at the site in May 2014 are shown on Figure 3.

The bank and re-vegetated areas in the vicinity of the interceptor trench appeared stable and covered with vegetation, as shown in Photos 1, 2, and 3. Seeps were not present at the base of the bank where seep samples were proposed to be collected, as shown in Photo 4.

The sumps, monitoring points, and monitoring wells were inspected and photographed (Photos 5 through 22). The sumps and monitoring points were checked to ensure that they were clearly labeled and flagged for identification and location. Monitoring Points MPA and MPC were filled with sediment above the screened interval. Monitoring Well MW-2 was missing its flush-mount monument and well cap (Photo 6), and was filled with about 3 feet of soil, leaving a water column of 0.56 foot. Monitoring Well MW-6 was frost jacked above the ground surface and had a loose flush-mount monument (Photo 10). The remaining monitoring wells were in generally good condition. Recovery Wells R6 and R7 (Photos 21 and 22, respectively) were located and observed to be dry and frost-jacked.

The locations of the monitoring wells were established with swing ties measurements to corners of the Eddie's Fireplace Inn building. The locations of the surface water samples and monitoring points were established with swing tie measurements to Sumps 1 and 2. Previous survey northing and easting information, and global positioning system (GPS) coordinates for the surface water locations are also provided in Table 2.

3.3 Decommissioning and Repairing Monitoring Wells

Recovery Wells R6 and R7 were decommissioned on May 13, 2014 following instruction from the ADEC. The well casings were removed from the ground and the holes were filled with surficial soils surrounding the wells, as shown in Photos 23 and 24.

After communicating the monitoring well conditions with the ADEC, the ADEC requested that Well MW-2 be decommissioned and Well MW-6 be repaired. These tasks were conducted by Johnson Drilling under Shannon & Wilson observation on June 11, 2014. Well MW-2 was decommissioned by filling the well casing with sand to above the water column which was approximately 17 feet below ground surface (bgs), filling the remaining well casing with bentonite chips to about 5 feet bgs, digging around the well casing and cutting 3 feet of the well casing off, backfilling with clean sand/gravel and repairing the ground with surrounding soil (Photo 25). Well MW-6 was repaired by cutting down 2 inches of the well casing and reinstalling the flush-mount monument in asphalt (Photo 26).

3.4 Surface Water Sampling

On May 13, 2014, surface water samples were collected from three locations on Eskimo Creek at the locations shown in Figure 3. Sample SW-1 was collected from below the interceptor trench (Photo 27). Sample SW-4 was collected from approximately 50 feet downstream from Sample SW-1 (Photo 27). Sample SW-5 was collected from upstream of the project site (Photo 28). The

surface water samples were collected by submerging an unpreserved sample container and slowly and continuously filling to minimize surface disturbance. The samples were then transferred to the appropriate preserved containers.

3.5 Groundwater Elevations

On May 12, 2014, prior to sampling the monitoring points and monitoring wells, a product/water interface probe was used to check for free-phase product and measure the depth to water in the existing recovery wells, monitoring wells, monitoring points, and sumps. The probe was decontaminated prior to insertion in each well or monitoring point. The water level measurements and calculated elevations are provided in Table 3.

3.6 Groundwater Sampling

On May 13, 2014, groundwater samples were collected from Monitoring Wells MW-1 and MW-5; Monitoring Points MPB and MPC; and Sump 2. Monitoring Point MP1 and Sump 1 contained 0.01 foot and 0.02 foot free-phase product, respectively, and were not sampled. Historically, free-phase product has been observed in Monitoring Point MP1 and Sump 1 more frequently than in the other monitoring points. Historical product monitoring data is presented in Table 8.

A low-flow method was used to purge and sample Monitoring Wells MW-1 and MW-5. The pump inlet was set to approximately 2 feet above the bottom of the wells. The pump was operated at approximately 0.5 liter per minute with a goal of limiting sustained water drawdown to a maximum of about 0.1 meter. Water quality parameters and water drawdown were monitored at approximately 4-minute intervals. Groundwater samples were collected when the water quality parameters stabilized. Water quality parameters were considered stabilized after three consecutive measurements indicating that pH was within 0.1 standard unit, specific conductance was within 3 percent, temperature was within 3 percent, and turbidity was within 10 percent or less than 10 nephelometric turbidity units (NTU). The water levels in the wells were greater than 80 percent of the pre-purge water volumes prior to sample collection. Water for the samples was pumped directly into laboratory-supplied containers. Purge water was contained in a 55-gallon drum and temporarily stored on site. The purging and sampling data are summarized in Table 3. Water sampling logs are provided in Appendix B.

For the monitoring point and sump samples, an initial water sample was collected with a dedicated disposable bailer to limit disturbance of sediments. Water quality parameters including pH, temperature, specific conductance, and turbidity were measured at the time of

sampling. The low-flow purging technique was used to purge Monitoring Point MPB, but the monitoring point did not recover 80 percent after one hour. Therefore, the initial sample was submitted for analysis. Monitoring Point MPC and Sump 2 did not contain sufficient water columns for purging, so the initial samples were submitted for analysis. The purge water from Monitoring Point MPB was contained in the 55-gallon drum.

For quality control purposes, two field duplicate samples, designated Samples MW-7 and Sump 3 (polycyclic aromatic hydrocarbons [PAHs] only), were collected from Monitoring Wells MW-1 and Sump 2, respectively.

3.7 Investigation Derived Waste Disposal

IDW for this project consisted of one 55-gallon drum of purge water and decontamination water from the May 2014 groundwater sampling, one 55-gallon drum containing recovered product and water mix from previous product recovery events, one 55-gallon drum of used and wrung-out sorbent pads, and disposable sampling materials such as gloves, tubing, and bailers. The purge and decontamination water was transported by air freight and received by Emerald for disposal on May 29, 2014. The product/water mix was transported by air freight and received by Emerald for disposal on June 23, 2014. The remaining IDW was disposed as unregulated solid waste at the local landfill. IDW documentation is provided in Appendix D.

4.0 LABORATORY ANALYSIS

The three surface water samples and seven groundwater samples, including two field duplicate samples, were tested for GRO by Alaska Method (AK) 101; DRO by AK 102; RRO by AK 103; and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B on a standard 10-working day turnaround time. The three surface water samples and two groundwater samples, including one field duplicate sample, were also tested for PAHs by EPA Method 8270D SIMS. For quality control purposes, one trip blank was included in the sampling program and was analyzed for GRO by AK 101 and BTEX by EPA Method 8021B. The project samples were submitted to SGS using chain-of-custody procedures.

Under the sample numbering scheme used for this project, a typical analytical sample name is 16631-SW-1. The “16631” indicates the Shannon & Wilson job number, and the “SW-1” designation is the sample identification. For brevity in the text of this report, the “16631-” prefix is omitted.

5.0 SUBSURFACE CONDITIONS

Static water levels in the monitoring wells ranged from about 22.37 feet below top of casing (btoc) in Well MW-2 to about 25.16 feet btoc in Well MW-6. Static water levels in the interceptor trench ranged from 8.91 feet btoc in Monitoring Point MP1 to 9.56 feet btoc in Monitoring Point MP5. Monitoring Points MP2, MP3, and MP4 were dry and free-phase product was observed in Monitoring Point MP1 and Sump 1. Static water levels in Monitoring Points MPB and MPC were 5.96 and 7.21 feet btoc, respectively. Monitoring Point MPA was dry. Groundwater elevations were measured on May 12, 2014 and ranged from 2.81 feet mean sea level (MSL) in Monitoring Well MW-1 to 3.43 feet MSL in Monitoring Well MW-4. Based on a in 2004 survey conducted at the site by Coastal Surveyors, the approximate elevation of Eskimo Creek is 1.5 feet. The approximate groundwater flow direction using May 12, 2014 measurements was towards the west, as shown on Figure 3. The hydraulic gradient was approximately 0.5 percent.

6.0 DISCUSSION OF RESULTS

The reported contaminant concentrations in the surface water samples and groundwater samples are compared to the clean up levels listed in 18 AAC 70.020 (April 2012) and to Table C in 18 AAC 75.345 (April 2012), respectively. The surface water and groundwater analytical results are summarized in Tables 4 and 5, respectively. Historical groundwater analytical results are summarized in Table 6. The analytical laboratory report is provided in Appendix C.

6.1 Surface Water Analytical Results

Three surface water samples were submitted for laboratory analysis. The project samples did not contain detectable concentrations of GRO, DRO, or RRO. The surface water Sample SW-1 contained an estimated (J-flagged) concentration of ethylbenzene. Samples SW-4 and SW-5 did not contain detectable concentrations of BTEX. Each surface water sample contained one estimated (J-flagged) PAH concentration: 1-methylnaphthalene in Sample SW-1 and naphthalene in Samples SW-2 and SW-3. Total aromatic hydrocarbon (TAH) and total aqueous hydrocarbon (TAqH) concentrations were calculated based on the total BTEX and total PAH concentrations. The TAH and TAqH concentrations were less than the water quality standards (10 and 15 micrograms per liter [µg/L], respectively).

6.2 Groundwater Analytical Results

Seven groundwater samples, including two field duplicate samples, were submitted for laboratory analysis. The primary and duplicate samples from Monitoring Well MW-1 contained

DRO (2.67 and 3.09 milligrams per liter [mg/L], respectively) and benzene (0.0527 and 0.0556 mg/L, respectively) at concentrations greater than ADEC Table C groundwater cleanup levels. Detectable concentrations (including J-flagged estimates) of GRO, toluene, ethylbenzene, and xylenes were also reported in these samples, but at concentrations less than applicable ADEC cleanup levels. The SGS report indicates that the chromatograph patterns for the primary and duplicate samples from Well MW-1 are consistent with a weathered gasoline.

Sample Sump 2 contained DRO (66.8 mg/L) and RRO (2.04 mg/L) concentrations greater than ADEC cleanup levels. Detectable concentrations of GRO, benzene, ethylbenzene, xylenes, and five PAH compounds were also reported in Sample Sump 2, but at concentrations less than applicable ADEC cleanup levels. However, it is noted that the PAH concentrations are biased high due to matrix interference or sample dilution. Also note that the SGS report indicates that the chromatograph pattern for Sample Sump 2 is consistent with a weathered middle distillate. For the remaining project samples, the analyte concentrations were less than ADEC Table C cleanup levels.

Elevated target analyte concentrations have consistently been documented in the samples from Monitoring Wells MW-1, MW-3, and MW-5 between 1999 and 2014, as shown in Table 6. Notably, concentrations of target analytes in Well MW-3 decreased to levels less than ADEC cleanup levels in October 2012. Concentrations of target analytes in Well MW-5 also decreased to levels less than ADEC cleanup levels by May 2014. Historically, target analytes in the samples from background Monitoring Wells MW-2, MW-4, and MW-6 have been at concentrations less than the laboratory report limits and/or less than the ADEC cleanup criteria. The only exception was the 1.35 mg/L RRO detected in the October 8, 2002 sample from Monitoring Well MW-2, which was attributed to oily surface water intrusion due to the position of the well with respect to a surface water drainage pathway.

6.3 Quality Assurance Summary

The project laboratory implements on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). External quality controls for this project include one trip blank and two field duplicate samples. Internal laboratory controls to assess data quality for this project include surrogates, method blanks, and laboratory control samples/laboratory control sample duplicates (LCS/LCSD) to assess precision and accuracy. If a DQO was not met, the project laboratory provides a report specific note identifying the problem in the case narrative section of their Laboratory Analysis Report (See Appendix C). Shannon & Wilson reviewed the SGS data deliverables and completed the

ADEC's Laboratory Data Review Checklist (LDRC) for the laboratory report, which is also included in Appendix C.

Trip blanks and method blanks were prepared and analyzed by the project laboratory. An estimated (J-flagged) concentration of xylenes was detected in the trip blank. The concentrations of xylenes in Samples MW-5, MPB, MPC, SW-1, SW-4, and SW-5 are within five times the detected concentration in the method blank. These results are therefore reported as non-detect and qualified with a "B" flag in Tables 4 and 5. Estimated (J-flagged) concentrations of DRO and RRO were reported in the method blank. The concentrations of DRO and/or RRO in project samples that are within five times the detected concentration in the method blank are reported as non-detect and qualified with a "B" flag in Tables 4 and 5.

The relative percent difference (RPD) between the project sample and associated duplicate results is a measure of precision affected by matrix heterogeneity, sampling technique, and laboratory analyses. Table 7 provides comparisons of the primary and field duplicate samples. Several PAH RPDs for Sample Sump 2 and its duplicate Sump 3 exceeded the DQO of 30 percent. However, the duplicate results are within a factor of two and therefore are considered usable. Additionally, the range of the analyte concentrations in each RPD exceedance were less than the applicable ADEC cleanup level and do not affect conclusions about the water quality.

Quality control discrepancies and the impact to data quality/usability are described in further detail in the LDRC. In our opinion, no non-conformances that would adversely impact data usability were noted, and we find the project data to be complete and useable to support the project purpose and objectives.

7.0 SUMMARY

Field activities consisted of evaluating current site conditions; measuring free-phase product accumulation in the monitoring wells, monitoring points, and sumps; surface and groundwater sampling; decommissioning one monitoring well and two recovery wells; repairing one monitoring well; and IDW disposal.

The bank and re-vegetated areas in the vicinity of the interceptor trench appeared stable and covered with vegetation. Seeps were not present at the base of the bank where seep samples have previously been collected.

After repairing Monitoring Well MW-6 and decommissioning Monitoring Well MW-2 and Recovery Wells R6 and R7, the remaining groundwater monitoring wells, monitoring points, and

sumps appeared to be in generally good condition with the exception of Monitoring Point MPA which has been dry since 2011 and is filled with sediment above the screened interval. Monitoring Points MP2, MP3, MP4, and MP5 were also reportedly dry during the May 2014 field activities, but are considered viable for future monitoring events. Recovery Wells R6 and R7 were decommissioned on May 13, 2014. On June 11, 2014, Monitoring Well MW-2 was decommissioned and Monitoring Well MW-6 was repaired.

Three surface water samples were collected from Eskimo Creek. Each surface water sample contained one PAH compound at an estimated (J-flagged) concentration, and one water sample contained an estimated (J-flagged) concentration of ethylbenzene. The surface water samples did not contain TAH or TAqH concentrations exceeding ADEC cleanup levels. The analytical results suggest that mitigation efforts to prevent product from entering the creek have been effective.

Seven groundwater samples, including two field duplicate samples, were collected. DRO and benzene concentrations measured in the primary and duplicate samples from Monitoring Well MW-1 exceed the ADEC Table C cleanup levels. The sample from Sump 2 contained DRO and RRO concentrations greater than ADEC cleanup levels. The remaining analyte concentrations were less than ADEC Table C standards. Free-phase product was observed in Sump 1 (0.01 foot) and Monitoring Point MP1 (0.02 foot).

The 55-gallon drums containing recovered product and water mix from previous product recovery events and the purge/decon water from the current event were transported to Emerald for disposal. The product storage connex was removed from the site.

8.0 RECOMMENDATIONS

The ADEC has requested the evaluation of potential remedial options in order to meet 18 AAC 75 groundwater cleanup levels and 18 AAC 70 surface water standards in a cost effective manner. Surface water samples collected from Eskimo Creek in 2014 did not exceed the applicable ADEC water quality standards. Groundwater impacted with petroleum hydrocarbons exceeding the ADEC cleanup levels remains in Monitoring Well MW-1 which is located downgradient of the former UST and upgradient of the product interceptor trench. Over time, the concentrations of petroleum hydrocarbons in Monitoring Wells MW-3 (downgradient of Monitoring Well MW-1) and Monitoring Well MW-5 (upgradient of Monitoring Well MW-1) have decreased to levels below the applicable cleanup levels. Free-phase product continues to be observed in the northern portion of the trench (Sump 1 and Monitoring Point MP1). As currently configured, the interceptor trench does not collect free-phase product at volumes which supports

effective product removal. Based on these factors, remedial options to increase the rate of cleanup may require alternative methods to remove product and source-area treatment of impacted groundwater and/or soil.

Potential remedial options that may be technically appropriate and practicable for this site include in-situ chemical oxidation, source area soil excavation, soil vapor extraction/air injection, enhanced bioremediation, active groundwater/product removal with collection galleries, and monitored natural attenuation (MNA). With the exception of MNA, each of these remedial options entails significant capital costs and/or ongoing operating expenses. MNA has much lower short-term costs, but may not satisfy the ADEC's objective of an expedited treatment time. However, to fully evaluate potential remedial options, additional site characterization activities are recommended to document current contaminant concentrations and non-aqueous phase liquid distribution at the site.

Monitoring Point MPA has been dry since 2011 and is filled with sediment above the screened interval; therefore we also recommend decommissioning the monitoring point.

9.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives. The findings we have presented within this report are based on the limited sampling and analyses that we conducted. They should not be construed as definite conclusions regarding the project site's surface water and groundwater conditions. It is possible that our tests missed higher levels, although our intention was to sample in accordance with the ADEC-approved work plan. As a result, the sampling and analyses performed can only provide you with our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised. Shannon & Wilson has prepared the document in Appendix E, Important Information About Your Geotechnical/Environmental Report, to assist you and others in understanding the use and limitations of our reports.

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 you, 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 obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and hard copies, or you question the authenticity of the report, please contact the undersigned.

We appreciate the opportunity to be of service. Please contact Timothy Terry, C.P.G. or the undersigned at (907) 561-2120 with any questions or comments concerning the contents of this report.

SHANNON & WILSON, INC.

Mathew S. Hemry, P.E.
Vice President

TABLE 1
WELL AND MONITORING POINT STATUS

Monitoring Point	Installation Date	Decommissioning Date	Casing Diameter	Casing Type	Depth (feet bgs)	Screened Interval (feet bgs)	Condition/Status	Recommendations
WP-1/MP6	June 1999	Assumed in 2002	-	-	-	-	Assume decommissioned	-
WP-2	June 1999	October 2002	-	-	-	-	Decommissioned	-
WP-3/MP7	June 1999	-	-	-	-	-	Not located since 2002	-
WP-4	June 1999	-	-	-	-	-	Not located since 2002	-
MW-1	June 1999	-	2-inch	PVC	29.5	19.5 to 29.5	Viable	-
MW-2	June 1999	June 2014	2-inch	PVC	23	19 to 29	Decommissioned	-
MW-3	June 1999	-	2-inch	PVC	30	20 to 30	Viable	-
MW-4	June 1999	-	2-inch	PVC	29	19 to 29	Viable	-
MW-5	June 1999	-	2-inch	PVC	29.5	20 to 29.5	Viable	-
MW-6	June 1999	-	2-inch	PVC	29.5	19.8 to 29.3	Frost jacked but viable after June 2014 repairs	-
R1	September 1999	October 2002	4-inch	PVC	-	-	Decommissioned	-
R2	September 1999	October 2002	4-inch	PVC	-	-	Decommissioned	-
R3	September 1999	October 2002	4-inch	PVC	-	-	Decommissioned	-
R4	September 1999	Jacked out of ground by 2000	4-inch	PVC	-	-	Jacked out of ground	-
R6	September 1999	5/13/2014	4-inch	PVC	1 on 5/13/14	0 to 1 on 5/13/14	Decommissioned	-
R7	September 1999	5/13/2014	4-inch	PVC	1 on 5/13/14	0 to 1 on 5/13/14	Decommissioned	-

Notes:
- = Not applicable or not known
PVC = Polyvinyl chloride
bgs = Below ground surface

TABLE 1
WELL AND MONITORING POINT STATUS

Monitoring Point	Installation Date	Decommissioning Date	Casing Diameter	Casing Type	Depth (feet bgs)	Screened Interval (feet bgs)	Condition/Status	Recommendations
Sump 1	November 2001	-	36-inch	ABS	7.5	-	Viable	-
Sump 2	November 2001	-	36-inch	ABS	7.5	-	Viable	-
MP1	November 2001	-	8-inch	PVC	7	-	Viable	-
MP2	November 2001	-	8-inch	PVC	7	-	Dry in May 2014	-
MP3	November 2001	-	8-inch	PVC	7	-	Dry in May 2014	-
MP4	November 2001	-	8-inch	PVC	7	-	Dry in May 2014	-
MP5	November 2001	-	8-inch	PVC	7	-	Dry in May 2014	-
MPA	October 2002	-	4-inch	PVC	2.5	4.5 to 7/ originally 6.5 to 9	Dry in May 2014	Decommission or blow out sediment and re-develop.
MPB	October 2002	-	4-inch	PVC	7.5	6 to 8.5/ originally 6.5 to 9	Viable	-
MPC	October 2002	-	4-inch	PVC	4.7	5 to 7.5/ originally 6.5 to 9	Viable, but sediment in well above screen interval	Decommission or blow out sediment and re-develop.

Notes:
- = Not applicable or not known
ABS = Acrylonitrile Butadiene Styrene
PVC = Polyvinyl chloride
bgs = Below ground surface

TABLE 2
WELL AND MONITORING POINT SWING TIES

Monitoring Well	Distance (feet) to Well:					Survey Coordinates*	
	Southwest corner of Eddie's	Southeast corner of Eddie's	Northwest corner of Eddie's	Northeast corner of Eddie's	Southwest corner of storage building	Northing	Easting
MW-1	87	-	25	-	-	9841.9	9847.2
MW-3	102	-	65.8	-	-	9805.0	9829.5
MW-4	-	86	-	105	-	9933.9	9980.5
MW-5	-	-	18.8	29	-	9880.5	9858.7
MW-6	-	-	-	24.6	24.6	9920.7	9879.4

Monitoring Point	Distance (feet) to Monitoring Point:		GPS Coordinates		Survey Coordinates*	
	Sump 1	Sump 2	Latitude	Longitude	Northing	Easting
Sump 1	-	47	-	-	9799.0	9799.0
Sump 2	47	-	-	-	9764.4	9831.3
MP1	9.4	38	-	-	9791.0	9804.0
MP2	19	28.4	-	-	9784.5	9811.3
MP3	28.3	19	-	-	9777.9	9817.9
MP4	37.7	9.6	-	-	9770.9	9824.2
MP5	83.7	36.5	-	-	9734.8	9852.7
MPA	20.7	42.7	-	-	9779.7	9791.4
MPB	18.7	52	-	-	9787.3	9784.4
MPC	44.8	84.5	-	-	9798.9	9754.2
SW-1	52	19	N 58.68320	W 156.67306	9747.7	9828.7
SW-4	109	67	N 58.68306	W 156.67331	-	-
SW-5	116	142	N 58.68349	W 156.67354	-	-

Notes:
* = Coordinates were obtained from 2004 survey performed by Coastal Surveyors
\- = Not available
GPS = Global Positioning System. Coordinates are in WGS84.
Eddie's = Eddie's Fireplace Inn

TABLE 3
WATER SAMPLING LOG

	Monitoring Well or Monitoring Point ID								
	MW-1	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MP1**	**MP2**	**MP3**
Water Level Measurement Data									
Date Water Level Measured	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014
Time Water Level Measured	14:37	12:53	14:12	12:58	13:44	13:29	17:32	17:28	17:21
Measuring Point Elevation*, Feet	26.74	25.71	25.95	28.56	27.08	-	-	-	-
Depth to Water Below MP, Feet	23.93	22.37	23.59	25.13	23.96	25.16	8.91	-	-
Water Level Elevation, Feet	2.81	3.34	2.36	3.43	3.12	-	-	-	-
Purging/Sampling Data									
Date Sampled	5/13/2014	-	-	-	5/13/2014		-	-	-
Time Sampled	17:35	-	-	-	16:00		-	-	-
Depth to Water Below MP, Feet	23.93	22.37	23.59	25.13	23.96	25.16	8.91	-	-
Total Depth of Well Below MP, Feet	28.95	22.93	28.96	28.52	28.67	28.45	9.11	8.84	9.46
Water Column in Well, Feet	5.02	0.56	5.37	3.39	4.71	3.29	0.20	0.00	0.00
Gallons per Foot	0.16	0.16	0.16	0.16	0.16	0.16	2.6	2.6	2.60
Gallons in Well	0.80	0.09	0.86	0.54	0.75	0.53	0.52	0.00	0.00
Total Gallons Pumped/Bailed	4	0	0	0	3.5	0	0	0	0
Purging Method	sub. pump	-	-	-	sub. pump	-	-	-	-
Sampling Method	sub. pump	-	-	-	sub. pump	-	-	-	-
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch	8-inch	8-inch	8-inch
Water Quality Data									
Product Thickness, Feet	0	0	0	0	0	0	0.02	0	0
Temperature, ^{o}C	7.13	-	-	-	5.94	-	-	-	-
Specific Conductance, µS/cm	558	-	-	-	304	-	-	-	-
pH, standard units	6.03	-	-	-	7.20	-	-	-	-
Turbidity, NTU	2.52	-	-	-	5.64	-	-	-	-
Remarks	duplicate MW-7	damaged - debris filled				frost-jacked casing	product in well	no water	no water

Notes:

Water quality parameters were measured with YSI-556 or Hanna pH/conducivity/temperature instrument and Hach turbidimeter.

* Monitoring well survey was conducted by Shannon & Wilson on October 25, 2012. Elevations are relative arbitrary benchmark with assigned elevation of 25.00 feet.

- = Indicates not applicable or not measured
MP = Measuring Point
^{o}C = Degrees Celsius
µS/cm = Microsiemens per centimeter
NTU = Nephelometric Turbidity Unit

TABLE 3
WATER SAMPLING LOG

	Monitoring Point, Sump, or Surface Water ID									
	MP4	**MP5**	**MPA**	**MPB**	**MPC**	**Sump 1**	**Sump 2**	**SW-1**	**SW-4**	**SW-5**
Water Level Measurement Data										
Date Water Level Measured	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	5/12/2014	-	-	-
Time Water Level Measured	17:17	17:05	16:50	16:44	16:39	17:38	17:11	-	-	-
Measuring Point Elevation, Feet	-	-	-	-	-	-	-	-	-	-
Depth to Water Below MP, Feet	-	9.56	-	5.96	7.21	9.21	8.94	-	-	-
Water Level Elevation, Feet	-	-	-	-	-	-	-	-	-	-
Purging/Sampling Data										
Date Sampled	-	-	-	5/13/2014	5/13/2014	-	5/13/2014	5/13/2014	5/13/2014	5/13/2014
Time Sampled	-	-	-	13:55	13:00	-	18:45	20:05	20:25	19:40
Depth to Water Below MP, Feet	-	9.56	-	5.96	7.21	9.21	8.94	-	-	-
Total Depth of Well Below MP, Feet	9.33	9.59	5.69	8.59	7.71	9.76	9.44	-	-	-
Water Column in Well, Feet	0.00	0.03	0.00	2.63	0.50	0.55	0.50	-	-	-
Gallons per Foot	2.6	2.6	0.65	0.65	0.65	53	53	-	-	-
Gallons in Well	0.00	0.08	0.00	1.71	0.33	29.1	26.5	-	-	-
Total Gallons Pumped/Bailed	0	0	0	1.75*	0	0	0	-	-	-
Purging Method	-	-	-	bailer	-	-	-	-	-	-
Sampling Method	-	-	-	bailer	bailer	-	bailer	grab	grab	grab
Diameter of Well Casing	8-inch	8-inch	4-inch	4-inch	4-inch	36-inch	36-inch	-	-	-
Water Quality Data										
Product Thickness, Feet	0	0	0	0	0	0.01	0	0	0	0
Temperature, ^{o}C	-	-	-	3.11	2.35	-	4.72	12.2	11.9	12.3
Specific Conductance, µS/cm	-	-	-	471	282	-	260	118	126	115
pH, standard units	-	-	-	6.90	6.57	-	5.88	7.28	7.34	7.28
Turbidity, NTU	-	-	-	45.5	>1,000	-	>1,000	6.36	5.76	5.60
Remarks	no water	trace water	no water			product in sump	HC odor & sheen, duplicate Sump 3			

Notes:

Water quality parameters were measured with YSI-556 or Hanna pH/conducivity/temperature instrument and Hach turbidimeter.

- = Indicates not applicable or not measured
* = Initial sample collected before purging was analyzed because water did not recover to 80% of pre-purged volume after 1 hour.
MP = Measuring Point
^{o}C = Degrees Celsius
µS/cm = Microsiemens per centimeter
NTU = Nephelometric Turbidity Unit
HC = hydrocarbon

TABLE 4
SURFACE WATER ANALYTICAL RESULTS

Parameter	Method	Cleanup Level**	Sample ID (See Table 3, Figure 3, and Appendix C*)			
			SW-1	SW-4	SW-5	TB
Gasoline Range Organics (GRO) - mg/L	AK 101	-	<0.0500	<0.0500	<0.0500	<0.0500
Diesel Range Organics (DRO) - mg/L	AK 102	-	<0.600 B	<0.300	<0.300	-
Residual Range Organics (RRO) - mg/L	AK 103	-	<0.500 B	<0.500 B	<0.250	-
Aromatic Volatile Organics (BTEX)						
Benzene - µg/L	EPA 8021B	-	<0.250	<0.250	<0.250	<0.250
Toluene - µg/L	EPA 8021B	-	<0.500	<0.500	<0.500	<0.500
Ethylbenzene - µg/L	EPA 8021B	-	**0.450 J**	<0.500	<0.500	<0.500
Xylenes - µg/L	EPA 8021B	-	<3.00 B	<3.00 B	<3.00 B	**1.38 J**
Polycyclic Aromatic Hydrocarbons (PAH)						
1-Methylnaphthalene - mg/L	EPA 8270D SIMS	-	**0.0197 J**	<0.0261	<0.0257	-
Naphthalene - mg/L	EPA 8270D SIMS	-	<0.0520	**0.0403 J**	**0.0447 J**	-
Other PAHs	EPA 8270D SIMS	-	ND	ND	ND	-
Total Aromatic Hydrocarbons (TAH) - µg/L	calculated	10	**0.450 J**	<4.25	<4.25	-
Total Aqueous Hydrocarbons (TAqH) - µg/L	calculated	15	**0.470 J**	**0.0403 J**	**0.0447 J**	-

Notes:

*	=	See Appendix C for compounds tested, methods, and laboratory reporting limits.
**	=	Surface water cleanup levels are listed in 18 AAC 70.020 (April 2012).
-	=	Not applicable or not sampled
0.205	=	Bold indicates analyte was detected.
TB	=	Quality control trip blank
mg/L	=	Milligrams per liter
µg/L	=	Micrograms per liter
<0.0500	=	Analyte not detected at or above the laboratory's limit of detection of 0.0500 mg/L.
<3.00 B	=	Reported concentration within five times trip blank or method blank concentration; analyte considered not detected at limit of quantitation of 3.00 mg/L.
J	=	Concentration is estimated at a value less than the laboratory's limit of quantitation. See SGS Laboratory Report in Appendix C.
ND	=	Not detected

TABLE 5
GROUNDWATER ANALYTICAL RESULTS

Parameter	Method	Cleanup Level**	Sample ID and Water Depth in Feet (See Table 3, Figure 3, and Appendix C*)							
			Downgradient Monitoring Wells			Monitoring Points		Sump		QC
			MW-1 23.93	MW-7~ 23.93	MW-5 23.96	MPB 5.96	MPC 7.21	Sump 2 8.94	Sump 3~ 8.94	TB -
Gasoline Range Organics (GRO) - mg/L	AK 101	2.2	**1.09 J+**	**1.22 J+**	**0.0991 J**	**0.0391 J**	<0.0500	**0.198**	-	<0.0500
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	**2.67**	**3.09**	<0.600 B	**1.19**	**1.25**	**66.8**	-	-
Residual Range Organics (RRO) - mg/L	AK 103	1.1	<0.500 B	<0.500 B	<0.250	<0.500 B	<0.500 B	**2.04**	-	-
Aromatic Volatile Organics (BTEX)										
Benzene - mg/L	EPA 8021B	0.005	**0.0527**	**0.0556**	**0.00168**	**0.00171**	**0.000330 J**	**0.00111**	-	<0.000250
Toluene - mg/L	EPA 8021B	1.0	**0.000580 J**	**0.000530 J**	<0.000500	<0.000500	<0.000500	<0.000500	-	<0.000500
Ethylbenzene - mg/L	EPA 8021B	0.7	**0.0762**	**0.0860**	**0.00380**	**0.000850 J**	<0.000500	**0.00791**	-	<0.000500
Xylenes - mg/L	EPA 8021B	10	**0.185**	**0.210**	<0.00300 B	<0.00300 B	<0.00300 B	**0.00279**	-	**0.00138 J**
Polycyclic Aromatic Hydrocarbons (PAH)										
Acenaphthene - mg/L	EPA 8270D SIMS	2.2	-	-	-	-	-	**0.00473 J+**	**0.00322 J+**	-
Anthracene - mg/L	EPA 8270D SIMS	11	-	-	-	-	-	**0.00105 J+**	**0.000683 J+**	-
Fluorene - mg/L	EPA 8270D SIMS	1.5	-	-	-	-	-	**0.00954 J+**	**0.00668 J+**	-
1-Methylnaphthalene - mg/L	EPA 8270D SIMS	0.15	-	-	-	-	-	**0.0717 J+**	**0.0697 J+**	-
Naphthalene - mg/L	EPA 8270D SIMS	0.73	-	-	-	-	-	<0.000272	<0.000255	-
Phenanthrene - mg/L	EPA 8270D SIMS	11	-	-	-	-	-	**0.00516 J+**	**0.00359 J+**	-
Other PAHs	EPA 8270D SIMS	-	-	-	-	-	-	ND	ND	-

Notes:

*	=	See Appendix C for compounds tested, methods, and laboratory reporting limits.
**	=	Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (April 2012).
~	=	Duplicate of preceding sample
^	=	Sheen was present on the water table.
-	=	Not applicable or not sampled
1.09	=	Bold indicates analyte was detected.
QC	=	Quality control
mg/L	=	Milligrams per liter
<0.250	=	Analyte not detected at or above the laboratory's limit of detection of 0.250 mg/L.
<0.600 B	=	Reported concentration within five times trip blank or method blank concentration; analyte considered not detected at limit of quantitation of 0.600 mg/L.
2.67	=	Concentration is greater than cleanup level.
J	=	Concentration is estimated at a value less than the laboratory's limit of quantitation. See SGS Laboratory Report in Appendix C.
J+	=	Estimated concentration. Surrogate recovery was biased high due to matrix interference or sample dilution. See ADEC Laboratory Data Review Checklist (LDRC) in Appendix C.
ND	=	Not detected

TABLE 6
SUMMARY OF HISTORICAL GROUNDWATER DATA

Monitoring Well	Date	Water Depth BTOC (Feet)	Target Analyte and Cleanup Level* (mg/L)						
			GRO 2.2	DRO 1.5	RRO 1.1	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10
MW-1	6/26/1999~	23.83	**3.7**	**6.4**	-	**0.10**	**0.14**	**0.16**	**0.72**
	10/8/2002	23.35	**1.41**	**9.99**	**<1.15**	**0.0565**	**0.0178**	**0.0779**	**0.263**
	6/3/2003	24.03	**3.13**	**292^**	**<10.8**	**0.0194**	<0.0200	**0.111**	**0.499**
	10/1/2004~	23.13	-	**36.0**	**<2.22**	**0.0669**	**0.0133**	**0.0997**	**0.3224**
	8/22/2006~	22.72	-	**11.3**	<0.500	**0.0642**	**0.0155**	**0.104**	**0.341**
	8/26/2009~	23.58	**1.48**	**4.30**	<0.446	**0.0417**	<0.0100	**0.0948**	**0.261**
	10/26/2012~	22.54	**2.21**	**4.96**	**0.206 J**	**0.0677**	**0.00246**	**0.114**	**0.323**
	5/13/2014~	23.93	**1.22 J+**	**3.09**	<0.500 B	**0.0556**	**0.000580 J**	**0.0860**	**0.210**
MW-2	6/26/1999	22.28	<0.10	<0.25	-	<0.002	<0.002	<0.002	<0.002
	10/8/2002	21.96	<0.0900	**0.650**	**1.35**	<0.00050	<0.0020	<0.0020	<0.0040
	6/3/2003	22.41	<0.0900	<0.313	<0.521	**0.00052**	<0.0020	<0.0020	<0.0020
	10/1/2004	21.82	-	<0.326	<0.543	<0.00040	<0.0010	<0.0010	<0.0020
	8/22/2006	21.10	-	<0.300	<0.500	<0.00040	<0.0010	<0.0010	<0.0020
	8/26/2009	21.89	<0.100	<0.714	<0.446	<0.00040	<0.0100	<0.0010	<0.0020
	10/26/2012	20.46	**0.0415 J**	<0.388	<0.322	<0.000240	<0.000620	<0.000620	<0.00188
	6/11/2014	Decommissioned							
MW-3	6/26/1999	23.56	**3.7**	**6.0**	-	**0.074**	**0.180**	**0.170**	**0.730**
	10/8/2002	21.73	**0.635**	**1.24**	<1.00	**0.0357**	**0.0167**	**0.0153**	**0.124**
	6/3/2003	23.65	<0.0900	**0.843**	**0.533**	**0.00480**	<0.00200	**0.00200**	**0.00398**
	10/1/2004	22.64	-	**3.00**	**0.910**	**0.0144**	**0.0138**	**0.0243**	**0.0896**
	8/22/2006	22.25	-	**1.46**	<0.526	**0.0088**	**0.00554**	**0.0113**	**0.0543**
	8/26/2009	23.09	Sample was not collected due to presence of free-phase product.						
	10/26/2012	22.23	**0.0423 J**	**0.908**	<0.300	0.000460	<0.000620	**0.000430 J**	**0.000700 J**
	5/13/2014	Not sampled							
MW-4	6/26/1999	25.09	<0.10	<0.25	-	<0.002	<0.002	<0.002	<0.002
	10/8/2002	24.46	<0.0900	<0.543	<1.09	<0.000500	<0.0020	<0.0020	<0.0020
	6/3/2003	25.20	<0.0900	<0.300	<0.500	<0.000500	<0.0020	<0.0020	<0.0020
	10/1/2004	23.88	-	<0.319	<0.532	<0.000400	<0.0010	<0.0010	<0.0020
	8/22/2006	20.46	-	<0.300	<0.500	<0.000400	<0.0010	<0.0010	<0.0020
	8/26/2009	23.70	<0.100	<0.714	<0.446	<0.000400	<0.0100	<0.0010	<0.0020
	10/26/2012	Well could not be accessed under frozen soil							
	5/13/2014	Not sampled							

Notes:

*	=	Groundwater cleanup levels from Table C, 18 AAC 75.345 (April 2012)
~	=	Higher of the sample and duplicate results is listed.
^	=	Sheen was present on the water sample.
BTOC	=	Below Top of Casing
mg/L	=	Milligrams per liter
1.41	=	Bold indicates that analyte was detected.
<1.15	=	< and bold indicates that listed reporting limit is greater than the cleanup level.
3.7	=	Reported concentration is greater than the cleanup level.
<1.15	=	Analyte not detected; laboratory reporting limit (before 2012) or limit of detection (2012 onward) of 1.15 mg/L.
-	=	Sample not analyzed for this parameter.
E	=	Estimated concentration; field duplicate RPD is greater than 30 percent.
B	=	Reported concentration within five times method blank concentration.
J	=	Concentration is estimated at a value less than the laboratory's limit of quantitation.
J+	=	Estimated concentration. Surrogate recovery was biased high.

TABLE 6
SUMMARY OF HISTORICAL GROUNDWATER DATA

Monitoring Well	Date	Water Depth BTOC (Feet)	Target Analyte and Cleanup Level* (mg/L)						
			GRO 2.2	DRO 1.5	RRO 1.1	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10
MW-5	11/10/1999	23.61	**4.7**	**4.6**	-	**0.046**	**0.012**	**0.110**	**0.150**
	10/8/2002	23.51	**2.07**	**70.0**	**<5.05**	**0.0793**	<0.0200	**0.0836**	**0.189**
	6/3/2003~	24.11	**0.747**	**26.4**	**<2.66**	**0.0182**	<0.0040	**0.0223**	**0.099**
	10/1/2004	23.33	-	**94.0**	**<5.81**	**0.0283**	**0.00140**	**0.0542**	**0.0735**
	10/3/2006	22.78	**0.326**	**21.7**	**5.77**	**0.0166**	<0.0010	**0.0189**	**0.0207**
	8/26/2009	23.68	**0.453**	**33.7^**	<0.446	**0.0203**	<0.0100	**0.0253**	**0.0375**
	10/26/2012~	22.56	**0.158**	**0.708 E**	<0.300	**0.00597**	**0.00275 E**	**0.00810**	**0.0134**
	5/13/2014	23.96	**0.0991 J**	<0.600 B	<0.250	**0.00168**	<0.000500	**0.00380**	<0.00300 B
MW-6	11/11/1999	24.55	<0.100	<0.27	-	<0.002	<0.002	<0.002	<0.002
	10/8/2002	24.67	<0.0900	<0.581	**<1.16**	<0.00050	<0.0020	<0.0020	<0.0020
	6/3/2003	25.22	<0.0900	<0.319	<0.532	<0.00050	<0.0020	<0.0020	<0.0020
	10/1/2004	24.61	-	<0.326	<0.543	<0.00040	<0.0010	<0.0010	<0.0020
	8/22/2006	24.15	-	<0.309	<0.515	<0.00040	<0.0010	<0.0010	<0.0020
	8/26/2009	25.90	<0.100	<0.714	<0.446	<0.00040	<0.0100	<0.0010	<0.0020
	10/26/2012	23.66	<0.0620	**0.366 J**	<0.300	<0.000240	<0.000620	<0.000620	<0.00188
	5/13/2014	Not sampled							

Notes:

*	=	Groundwater cleanup levels from Table C, 18 AAC 75.345 (April 2012)
~	=	Higher of the sample and duplicate results is listed.
^	=	Sheen was present on the water sample.
BTOC	=	Below Top of Casing
mg/L	=	Milligrams per liter
0.366	=	Bold indicates that analyte was detected.
<1.15	=	< and bold indicates that listed reporting limit is greater than the cleanup level.
4.7	=	Reported concentration is greater than the cleanup level.
<0.100	=	Analyte not detected; laboratory reporting limit (before 2012) or limit of detection (2012 onward) of 0.100 mg/L.
-	=	Sample not analyzed for this parameter.
E	=	Estimated concentration; field duplicate RPD is greater than 30 percent.
B	=	Reported concentration within five times trip blank or method blank concentration.
J	=	Concentration is estimated at a value less than the laboratory's limit of quantitation.
J+	=	Estimated concentration. Surrogate recovery was biased high.

TABLE 7
QUALITY CONTROL DATA

Parameter	Primary Sample MW-1	Duplicate Sample MW-7	Precision (RPD)	Precision QC Limit
Gasoline Range Organics (GRO) - mg/L	1.09 J+	1.22 J+	11%	30%
Diesel Range Organics (DRO) - mg/L	2.67	3.09	15%	30%
Residual Range Organics (RRO) - mg/L	<0.500 B	<0.500 B	NA	30%
Aromatic Volatile Organics (BTEX)				
Benzene - mg/L	0.0527	0.0556	5%	30%
Toluene - mg/L	0.000580 J	0.000530 J	9%	30%
Ethylbenzene - mg/L	0.0762	0.0860	12%	30%
Xylenes - mg/L	0.185	0.210	13%	30%

Parameter	Primary Sample Sump 2	Duplicate Sample Sump 3	Precision (RPD)	Precision QC Limit
Polycyclic Aromatic Hydrocarbons (PAH)				
Acenaphthene - mg/L	0.00473 J+	0.00322 J+	**38%**	30%
Anthracene - mg/L	0.00105 J+	0.000683 J+	**42%**	30%
Fluorene - mg/L	0.00954 J+	0.00668 J+	**35%**	30%
1-Methylnaphthalene - mg/L	0.0717 J+	0.0697 J+	3%	30%
Naphthalene - mg/L	<0.000272	<0.000255	NA	30%
Phenanthrene - mg/L	0.00516 J+	0.00359 J+	**36%**	30%

Shading and bold indicate that the relative percent difference is greater than the quality control limit

Notes:

RPD = Relative Percent Difference
QC = Quality Control
NA = RPD not calculated due to non-detectable results.
<0.000272 = Analyte not detected at or above the laboratory's limit of detection of 0.000272 mg/L.
J = Concentration is estimated at a value less than the laboratory's limit of quantitation. See SGS Laboratory Report in Appendix C.
J+ = Estimated concentration. Surrogate recovery was biased high due to matrix interference or sample dilution. See ADEC Laboratory Data Review Checklist (LDRC) in Appendix C.
<0.600 B = Reported concentration within five times method blank concentration; analyte considered not detected at limit of quantitation of 0.500 mg/L. See ADEC LDRC in Appendix C.
mg/L = Milligrams per liter

TABLE 8
HISTORICAL PRODUCT MONITORING DATA

Measurement Date	Product Thickness (inches)											
	Sump 1 (North Sump)	MP1	MP2	MP3	MP4	Sump 2 (South Sump)	MP5	R6	R7	MPA	MPB	MPC
11/18/2001	0.1	0*	0*	0	0	0	0.1	-	-	-	-	-
12/6/2001	1	-	-	-	-	0*	-	-	-	-	-	-
12/7/2001	0	-	-	-	-	0*	-	-	-	-	-	-
12/8/2001	0*	-	-	-	-	0*	-	-	-	-	-	-
12/9/2001	0*	-	-	-	-	0*	-	-	-	-	-	-
12/10/2001	0*	-	-	-	-	0*	-	-	-	-	-	-
1/31/2002	1	-	-	-	-	1	-	-	-	-	-	-
2/27/2002	0.75	-	-	-	-	0.75	-	-	-	-	-	-
3/27/2002	1	-	-	-	-	0.5	-	-	-	-	-	-
4/29/2002	1	-	-	-	-	0.25	-	-	-	-	-	-
5/28/2002	1.25	-	-	-	-	0.25	-	-	-	-	-	-
6/28/2002	1	-	-	-	-	0.25	-	-	-	-	-	-
7/31/2002	1	-	-	-	-	0.5	-	-	-	-	-	-
8/27/2002	1	-	-	-	-	0.25	-	-	-	-	-	-
9/30/2002	0*	-	-	-	-	0*	-	-	-	-	-	-
1/6/2003	0.5	-	-	-	-	0.5	-	-	-	-	-	-
5/20/2003	0.25	-	-	-	-	0.25	-	-	-	-	-	-
6/21/2003	0.5	-	-	-	-	0.25	-	-	-	-	-	-
7/20/2003	0.5	-	-	-	-	0.25	-	-	-	-	-	-
8/26/2003	0.75	-	-	-	-	0*	-	-	-	-	-	-
9/28/2003	0.75	-	-	-	-	0*	-	-	-	-	-	-
11/21/2003	0.5	-	-	-	-	0.5	-	-	-	-	-	-
12/15/2003	0.25	-	-	-	-	0*	-	-	-	-	-	-
1/20/2004	0.5	-	-	-	-	0.25	-	-	-	-	-	-
2/28/2004	0	-	-	-	-	0	-	-	-	-	-	-
3/28/2004	0.25	-	-	-	-	0*	-	-	-	-	-	-
4/28/2004	0.25	-	-	-	-	0*	-	-	-	-	-	-
5/28/2004	0*	-	-	-	-	0*	-	-	-	-	-	-
6/28/2004	0*	-	-	-	-	0*	-	-	-	-	-	-
10/1/2004	0*	0	0	0	0	0*	0	0	0	-	-	-
12/9/2004	0.5	0	0	0	0	0	-	-	-	-	-	-

Notes:

* = Sheen was observed
\- = Measurement not available
^ = Dry

TABLE 8
HISTORICAL PRODUCT MONITORING DATA

Measurement Date	Product Thickness (inches)											
	Sump 1 (North Sump)	MP1	MP2	MP3	MP4	Sump 2 (South Sump)	MP5	R6	R7	MPA	MPB	MPC
1/13/2005	0.5	0	0	0	0	0*	-	-	-	-	-	-
2/15/2005	0.25	0*	0	0	0	0	-	-	-	-	-	-
3/30/2005	0.25	0	0	0	0	0	-	-	-	-	-	-
4/18/2005	0.5	0.25	0^	0^	0^	0	-	-	-	-	-	-
5/20/2005	0.25	1	0^	0^	0^	0	-	-	-	-	-	-
6/10/2005	0.5	0.5	0^	0.25	0^	0	-	-	-	-	-	-
9/19/2005	1	0.5	1	0.5	0.25	0.25	0.25	-	-	-	-	-
10/24/2005	1	1	0	0	0	0	0	0	0	-	-	-
1/31/2006	0	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	-	-	-
2/23/2006	0	0	Frozen	Frozen	Frozen	0	Frozen	Frozen	Frozen	-	-	-
3/24/2006	0	Frozen	Frozen	Frozen	Frozen	0	Frozen	Frozen	Frozen	-	-	-
4/5/2006	0	Frozen	Frozen	Frozen	Frozen	0	Frozen	Frozen	Frozen	-	-	-
5/1/2006	0	Frozen	Frozen	Frozen	Frozen	0	Frozen	Frozen	Frozen	-	-	-
6/9/2006	0	0	0	0	0	0	0	0	0	-	-	-
8/21/2006	0.25	0	0	0	0	0	0	0	0	-	-	-
9/25/2006	0.125	0.125	0	0	0	0	0	0	0	-	-	-
10/31/2006	0	0	0	0	0	0	0	0	0	-	-	-
11/22/2006	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	-	-	-
12/29/2006	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	-	-	-
4/13/2007	0	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	-	-	-
5/30/2007	0	0	0^	0^	0^	0	0^	0	0	-	-	-
6/18/2007	0	0	0	0	0^	0	0^	0	0	-	-	-
8/20/2007	0.5	0.25	0	0	0	0	0	-	-	-	-	-
9/24/2007	0.5	0	0	0	0	0	0	-	-	-	-	-
10/16/2007	0.25	0	0	0	0	0	0	-	-	-	-	-
10/23/2007	0	0	0	0	0	0	0	-	-	-	-	-
5/6/2008	0		0	0	0	0	0	~	~	-	-	-
6/24/2008	0	0	0	0	0	0	0	~	~	-	-	-
8/19/2008	0.04	0.02	0	0	0	0	0	~	~	-	-	-
9/12/2008	0.02	0	0	0	0	0	0	~	~	-	-	-

Notes:

* = Sheen was observed
\- = Measurement not available
^ = Dry
~ = Recovery Wells R6 and R7 were not located since May 2008 and assumed to be destroyed.

TABLE 8
HISTORICAL PRODUCT MONITORING DATA

Measurement Date	Product Thickness (inches)											
	Sump 1 (North Sump)	MP1	MP2	MP3	MP4	Sump 2 (South Sump)	MP5	R6	R7	MPA	MPB	MPC
9/20/2008	0	0	0	0	0	0	0	~	~	-	-	-
9/25/2008	0	0	0	0	0	0	0	~	~	-	-	-
5/20/2009	0	0	0	0	0	0	0	~	~	-	-	-
7/25/2009	0	0	0	0	0	0	0	~	~	-	-	-
8/24/2009	0	0	0	0	0	0	0	~	~	-	-	-
8/27/2009	0	0	0	0	0	0	0	~	~	0	0	0
9/26/2009	0	0	0	0	0	0	0	~	~	-	-	-
10/24/2009	0.5	0	0	0	0	0	0	~	~	-	-	-
11/17/2009	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	~	~	Frozen	Frozen	Frozen
6/28/2010	0	0	0	0	0	0	0	~	~	-	-	-
8/31/2010	0	0	0	0	0	0	0	~	~	0	0	0
9/30/2010	0	0.25	0	0	0	0	0	~	~	0	0	0
10/21/2010	0	2.04	0	0	0	0	0	~	~	0	0	0
5/15/2011	0.5	0	0	0	0	0	0	~	~	0	0	0
5/20/2011	0	0	0	0	0	0	0	~	~	-	-	-
7/31/2011	0.5	0	0	0	0	0	0	~	~	0	0	0
8/19/2011	0	0.12	0.12	0	0	0	0	~	~	^	0	0
8/30/2011	0	0	0	0	0	0	0	~	~	0	0	0
11/4/2011	0	0	0	0	0	0	0	~	~	0	0	0
5/30/2012	1	0	^	^	^	0	0	~	~	^	0	0
10/25/2012	0*	0*	0*	0*	0	0*	0	~	~	^	0	0*
6/13/2013	1	0	^	^	^	0	^	~	~	^	0	0
5/12/2014	0.12	0.24	^	^	^	0	0	~	~	^	0	0

Notes:

* = Sheen was observed
\- = Measurement not available
^ = Dry
~ = Recovery Wells R6 and R7 were not located since May 2008 and assumed to be destroyed.

Map from USGS Naknek C-2 Quad
Elevation in feet

0 1 2
APPROXIMATE SCALE IN MILES

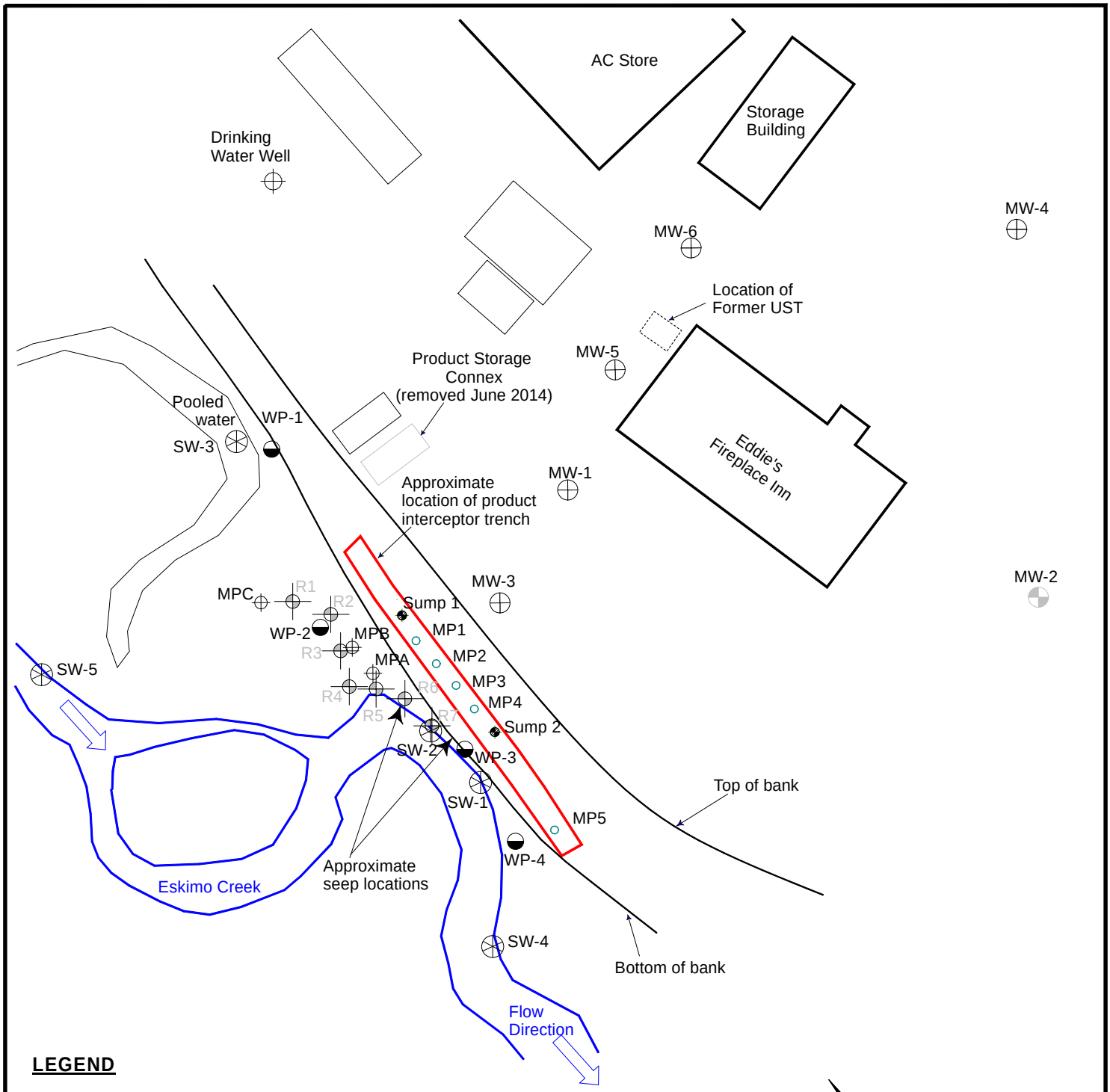
Eskimo Creek
King Salmon, Alaska

VICINITY MAP

August 2014 32-1-16631-011

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1



LEGEND

MW-1	Approximate location of Monitoring Well MW-1, installed by Hart Crowser in 1999.
MW-2	Approximate location of Former Monitoring Well MW-2 decommissioned in June 2014.
R6	Approximate location of Former Recovery Well R6, installed by Philip Services in September 1999.
WP-3	Approximate location of Former Well Point WP-3, installed by Hart Crowser on June 25, 1999
Sump 1	Approximate location of product recovery sump, installed by Shannon & Wilson in November 2001.
MP4	Approximate location of Monitoring Point MP4 installed by Shannon & Wilson in November 2001.
MPA	Approximate location of Monitoring Point MPA, installed by Shannon & Wilson in October 2002
SW-1	Approximate location of Surface Water Sample Location SW-1

0 40 80
APPROXIMATE SCALE IN FEET

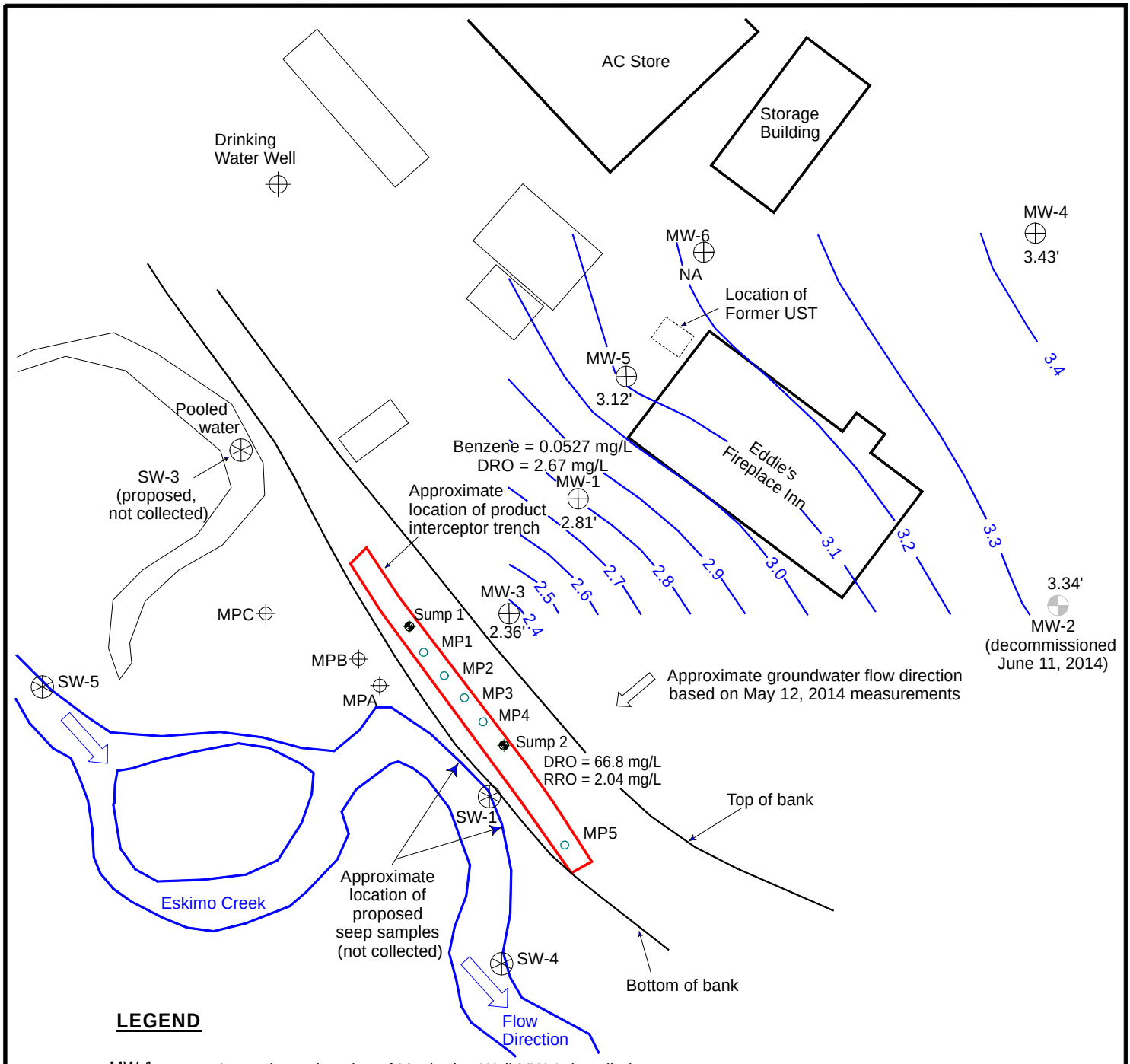
Eskimo Creek
King Salmon, Alaska

SITE PLAN

August 2014 32-1-16631-011

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 2



LEGEND

MW-1 ⊕	Approximate location of Monitoring Well MW-1, installed by Hart Crowser in 1999.
2.81'	Groundwater elevation in feet relative to temporary benchmark based on May 12, 2014 measurements.
MW-2 ⊕	Approximate location of Former Monitoring Well MW-2 decommissioned in June 2014.
NA	Not availble
2.5	Groundwater elevation contour in feet relative to temporary benchmark based on May 12, 2014 measurements.
Sump 1	Approximate location of product recovery sump, installed by Shannon & Wilson in November 2001.
MP4 ○	Approximate location of Monitoring Point MP4 installed by Shannon & Wilson in November 2001.
MPA ⊕	Approximate location of Monitoring Point MPA, installed by Shannon & Wilson in October 2002
SW-1 ⊗	Approximate location of Surface Water Sample Location SW-1
Benzene = 0.0527 mg/L DRO = 2.67 mg/L RRO = 2.04 mg/L	Analytical results from analytical groundwater sample that exceed ADEC cleanup criteria (miligrams per liter).

0 40 80
APPROXIMATE SCALE IN FEET

Eskimo Creek
King Salmon, Alaska

SITE PLAN - 2014 CONDITIONS

August 2014 32-1-16631-011

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Fig. 3

APPENDIX A

SITE PHOTOGRAPHS

Photo 1: Looking northeast from Eskimo Creek at the re-vegetated and stabilized area in the vicinity of the interceptor trench. (May 12, 2014)

Photo 2: Looking southeast at the stabilized slope above the interceptor trench. Sump 1 in the foreground. (May 12, 2014)

Eskimo Creek
King Salmon, Alaska

PHOTOS 1 and 2

August 2014 32-1-16631-011

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Photo 3: Looking southwest at the re-vegetated and stabilized area in the vicinity of the interceptor trench, with Eskimo Creek in the background. (May 12, 2014)

Photo 4: Seeps were not present at the base of the bank where seep samples were previously collected. (May 12, 2014)

Photo 5: Monitoring Well MW-1 was in good condition. (May 12, 2014)

Photo 6: Monitoring Well MW-2 was missing its protective monument and well cap, and was filled with about 3 feet of soil. (May 12, 2014)

Photo 7: Monitoring Well MW-3 was in good condition. (May 12, 2014)

Photo 8: Monitoring Well MW-4 was in good condition. (May 12, 2014)

Photo 9: Monitoring Well MW-5 was in good condition.
(May 12, 2014)

Photo 10: The well casing of Monitoring Well MW-6 was frost-jacked, and the flush-mount monument was loose.
(May 12, 2014)

Photo 11: Monitoring Point MPA was dry and filled with sediment above the screened interval. (May 12, 2014)

Photo 12: Monitoring Point MPB was viable. (May 12, 2014)

Photo 13: Monitoring Point MPC was viable, but sediment or debris in the well was above the screen interval. (May 12, 2014)

Photo 14: Monitoring Point MP1 was in good condition. (May 12, 2014)

Photo 15: Monitoring Point MP2 was in good condition. (May 12, 2014)

Photo 16: Monitoring Point MP3 was in good condition. (May 12, 2014)

Photo 17: Monitoring Point MP4 was in good condition.
(May 12, 2014)

Photo 18: Monitoring Point MP5 was in good condition.
(May 12, 2014)

Photo 19: Sump 1 was in good condition. (May 12, 2014)

Photo 20: Sump 2 was in good condition. (May 12, 2014)

Photo 21: Recovery Well R6 was dry and frost-jacked. (May 12, 2014)

Photo 22: Recovery Well R7 was dry. The well was removed from the ground to help identify it and was decommissioned the following day. (May 12, 2014)

Photo 23: Recovery Well R6 was decommissioned on May 13, 2014 by removing the well from the ground and filling the hole with nearby soil. (May 13, 2014)

Photo 24: Recovery Well R7 was decommissioned on May 13, 2014 by removing the well from the ground and filling the hole with nearby soil. (May 13, 2014)

Photo 25: Monitoring Well MW-2 was decommissioned on June 11, 2014. (June 11, 2014)

Photo 26: Monitoring Well MW-6 after repairs on June 11, 2014. (June 11, 2014)

Photo 27: Looking northeast at Surface Water Location SW-4, in the foreground adjacent to the bucket, and Surface Water Location SW-1 indicated by the arrow. (May 13, 2014)

Photo 28: Looking south and downstream from Surface Water Location SW-5. (May 12, 2014)

APPENDIX B

FIELD NOTES

GROUNDWATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 16631-11

Page 1 of 1

Owner/Location ADEC / Eskimo Creek King Salmon

Well No.: MW-1 Random No.: — Date: 5/13/14

Weather: Sunny 50's F Time Started: 1650 Time Completed: 1815

MEASUREMENT DATA

Measuring Point (MP): TOC

Height of MP Above or Below Land Surface: → 0.32'

MP Elevation: 26.74 Water Level Elevation: 2.81

Total Depth of Well Below MP: 28.95

Time of Depth Measurement: 1437 5/12/14 DTW Below MP: 23.93 80% = 24.93'

Water Column in Well: 5.02

Diameter of Casing: 2 inch Gallons per ft: 0.16 Gallons in Well: 0.80

Gallons ~~to be~~ Pumped/~~Bailed~~ : 4

Development Information: —

FIELD PARAMETERS

Time: Odor: Color: Clear

Volume: ~~ORP~~:	Time	pH: SU	Sp. Cond. mS	Temp: °C	~~DO~~: Drawdown ft.	Turbidity: NTU
0.5 gal	1708	5.86	0.645	7.67	24.26	5.45
1	1712	5.95	0.605	7.41	24.27	4.06
1.5	1716	6.00	0.583	7.29	24.27	3.43 ✓
2	1720	6.03	0.570	7.22	24.27	3.27 ✓
2.5	1724	6.03	0.560	7.17	24.27	2.94 ✓
3	1728	6.03 ✓	0.560 ✓	7.12 ✓	24.27	2.66 ✓
3.5	1732	6.03 ✓	0.558 ✓	7.13 ✓	24.27	2.52 ✓

Evacuation Method: whale pump low flow

Sampling Method: whale pump low flow Sample Time: 1735

Sample ID, Analysis, Preservatives: 16631-MW-1, 6RO/BTEX/DRO/RRO, HCl

5 jars

Remarks: Duplicate: ~~MW~~ (DUP) 16631-MW-~~1~~ 2 @ 1745

Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Set pump 2' above bottom, start purging 17:04 @ about ~0.5 L/min
used Hannah calibrated for pH only (YSI-556 pH failed)

GROUNDWATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 16631-11

Page 1 of 1

Owner/Location ADEC / Eskimo Creek King Salmon

Well No.: MW5 Random No.: — Date: 5/13/14

Weather: Sunny 50s°F Time Started: 1515 Time Completed: 1610

MEASUREMENT DATA

Measuring Point (MP): TOC

Height of MP Above or (Below) Land Surface: —

MP Elevation: ~~NA~~ 27.08' (ASL) Water Level Elevation: ~~NA~~ (ASL) 3.12

Total Depth of Well Below MP: 28.67

Time of Depth Measurement: 1344 5/12/14 DTW Below MP: 23.96 80% = 24.88

Water Column in Well: 4.71

Diameter of Casing: 2 inch Gallons per ft: 0.16 Gallons in Well: 0.75

Gallons ~~to be~~ Pumped/~~Bailed~~: 3.5

Development Information: ✓

FIELD PARAMETERS

Time: — Odor: Hydrocarbon? Color: mostly clear slight sheen in bucket. water in

Volume: ~~ORP~~	Time	pH: SU	Sp. Cond. mS	Temp: °C	~~DO~~ Drawdown ft	Turbidity: NTU
0.5 gal	15.38	~~7.22~~	0.296	6.69	24.03	81.0
1	1542	7.00	0.300	5.99	24.03	24.0
1.5	1546	7.02	0.303 ✓	6.02	24.02	9.21
2	1550	7.20	0.304 ✓	5.95 ✓	24.02	8.48
2.5	1554	7.21	0.302 ✓	5.97 ✓	24.02	4.28 ✓
3	1558	7.20 ✓	0.304 ✓	5.94 ✓	24.02	5.64 ✓

Evacuation Method: Sub. pump (whale)

Sampling Method: Sub pump (whale) Sample Time: 1600

5 jars Sample ID, Analysis, Preservatives: 16631-MW-5, GRO/BTEX/DRO/RRO, MU

Remarks: Pump 2' above bottom, set at about 0.5 L/min (low flow)

Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

GROUNDWATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 16631-11
Page 1 of 1

Owner/Location ADEC / Eskimo Creek King Salmon

Well No.: MPB Random No.: — Date: 5/13/14

Weather: Sunny 50s°F Time Started: 1340 Time Completed: 1505

MEASUREMENT DATA

Measuring Point (MP): TOC

Height of MP Above or Below Land Surface: ~1.1'

MP Elevation: NA Water Level Elevation: NA

Total Depth of Well Below MP: 8.59

Time of Depth Measurement: 1644 5/12/14 DTW Below MP: 5.96 80% = 6.49'

Water Column in Well: 2.63

Diameter of Casing: 4 inch Gallons per ft: 0.65 Gallons in Well: 1.71

Gallons to ~~be Pumped~~ (Bailed): 1.75

Development Information: —

FIELD PARAMETERS

Time: — Odor: None Color: Slightly yellow

	Volume:	ORP:	pH:	Sp. Cond.	Temp:	DO:	Turbidity:
			su	mS	°C		NTU
initial	0	—	6.90	0.471	3.11 (downhole)	—	45.5

Evacuation Method: bailer

Sampling Method: bailer Sample Time: (initial) 13:55

5 jars Sample ID, Analysis, Preservatives: 16631-MPB, GRO/BTEX/DRO/RRO HCl

Remarks: initial sample from before bailing. Sample did not recover 80% after 1 hr.

Sampling Personnel: Andrew Lee → keep initial sample.

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

GROUNDWATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 16631-11

Page 1 of 1

Owner/Location ADEC / Eskimo Creek King Salmon

Well No.: MPC Random No.: _____ Date: 5-13-14

Weather: Sunny 50s °F Time Started: 1240 Time Completed: 1335

MEASUREMENT DATA

Measuring Point (MP): TOC

Height of MP Above or Below Land Surface: 3.40'

MP Elevation: NA Water Level Elevation: NA

Total Depth of Well Below MP: 7.71

Time of Depth Measurement: 7.21' @ 1634 5/12/14 DTW Below MP: 7.21 WOB = 7.31'

Water Column in Well: 0.50

Diameter of Casing: 4-inch Gallons per ft: 0.65 Gallons in Well: 0.33

Gallons to be Pumped/Bailed : 0

Development Information: —

FIELD PARAMETERS

Time: 1320 Odor: none Color: brown Hach 2100P

Volume:	ORP:	pH:	Sp. Cond.	Temp:	DO:	Turbidity:
(down hole for YSI-556) 0		6.57	~~0.011~~ 0.282	~~4.2~~ 2.35 (15.9)		NTU >1000

Evacuation Method: none

Sampling Method: bailer Sample Time: 1300

Sample ID, Analysis, Preservatives: 16631-MPC, GRO/BTEX / DRO/RRO, HCl (5 jars)

Remarks: Collected & used initial sample. Not enough water to use low flow sampling - failed attempt

Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

GROUNDWATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 16631-11
Page 1 of 1

Owner/Location AOEC / Eskimo Creek King Salmon
Well No.: Sump 2 Random No.: — Date: 5/13/14
Weather: Sunny 50°F Time Started: 1822 Time Completed: 1920

MEASUREMENT DATA

Measuring Point (MP): TOC
Height of MP Above or Below Land Surface: NA
MP Elevation: NA Water Level Elevation: NA
Total Depth of Well Below MP: 9.44
Time of Depth Measurement: 1711 5/12/14 DTW Below MP: 8.94
Water Column in Well: 0.50
Diameter of Casing: 36 inch Gallons per ft: 53 Gallons in Well: 26.5
Gallons to be Pumped/Bailed : 0

Development Information: —

FIELD PARAMETERS

Time: 1913 Odor: Hydrocarbon Color: gray, sheen

Volume	ORP	pH	Sp. Cond.	Temp	DO	Turbidity
0	—	SU 5.88	mS 0.260	°C 4.72	—	NTU >1000

Evacuation Method: None
Sampling Method: Bailer Sample Time: 1845
Sample ID, Analysis, Preservatives: 16631-Sump2, GRO/BTEX/DRO/RRO/PAH
Remarks: No purge: not enough water depth for pump, too shallow to bail one well volume.
Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

7J05

2J03 * Duplicate PAH only: 16631-Sump3 @ 1855

Shannon & Wilson, Inc.

Surface ~~GROUND~~WATER SAMPLING LOG

Job No: 16631-11

Page 1 of 1

Owner/Location ADEC / Eskimo Creek King Salmon

Location
~~Well~~ No.: SW-1 Random No.: _____ Date: 5/13/14

Weather: Sunny 50s°F Time Started: 1953 Time Completed: 2015

MEASUREMENT DATA

NA

Measuring Point (MP): _____

Height of MP Above or Below Land Surface: _____

MP Elevation: _____ Water Level Elevation: _____

Total Depth of Well Below MP: _____

Time of Depth Measurement: _____ DTW Below MP: _____

Water Column in Well: _____

Diameter of Casing: _____ Gallons per ft: _____ Gallons in Well: _____

Gallons to be Pumped/Bailed : _____

Development Information: _____

FIELD PARAMETERS

Time: _____ Odor: none Color: clear

Volume	ORP	pH	Sp. Cond.	Temp	DO	Turbidity
		7.28	118 mS	12.2 °C	-	6.36 NTU

Evacuation Method: —

Sampling Method: grab - submerge container Sample Time: 2005

7 jars Sample ID, Analysis, Preservatives: 16631-SW-1, GRO/BTEX/DRO/RRO/PAH

Remarks: GPS N. 58.69320 W 156.17316

Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Shannon & Wilson, Inc.

Surface ~~GROUND~~WATER SAMPLING LOG

Job No: 16631-11

Page 1 of 1

Owner/Location ADEC / Eskimo Creek King Salmon

Well No.: SW-4 (downstream) Random No.: — Date: 5/13/14

Weather: sunny 50°s F Time Started: 2015 Time Completed: 2045

MEASUREMENT DATA

NA

Measuring Point (MP): _____

Height of MP Above or Below Land Surface: _____

MP Elevation: _____ Water Level Elevation: _____

Total Depth of Well Below MP: _____

Time of Depth Measurement: _____ DTW Below MP: _____

Water Column in Well: _____

Diameter of Casing: _____ Gallons per ft: _____ Gallons in Well: _____

Gallons to be Pumped/Bailed : _____

Development Information: _____

FIELD PARAMETERS

Time: 2029 Odor: none Color: clear

Volume	ORP	pH	Sp. Cond.	Temp	DO	Turbidity
		7.34	0.126 mS	11.9°C		5.76 NTU

Evacuation Method: —

Sampling Method: grab submersible container Sample Time: 2025

7 jars Sample ID, Analysis, Preservatives: 16631-SW-4, GRO/BTEX/DRO/RRO/PAH

Remarks: GPS N 58.68306 W 156.67331

Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

Surface

GROUNDWATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 16631-11

Page 1 of 1

Owner/Location ADEC / Eskimo Creek Knik Salmon

Location
~~Well~~ No.: SW-5 Random No.: — Date: 5/13/14

(upstream)
Weather: Sunny 50s F Time Started: 1925 Time Completed: 1953

MEASUREMENT DATA

Measuring Point (MP): NA

Height of MP Above or Below Land Surface:

MP Elevation: Water Level Elevation:

Total Depth of Well Below MP:

Time of Depth Measurement: DTW Below MP:

Water Column in Well:

Diameter of Casing: Gallons per ft: Gallons in Well:

Gallons to be Pumped/Bailed :

Development Information:

FIELD PARAMETERS

Time: 1946 Odor: none Color: clear

Volume	ORP	pH	Sp. Cond.	Temp	DO	Turbidity
	57	7.28	0.115 mS	~~12.6~~ 12.3 °C (ASC)	—	5.60 NTU

OK

Evacuation Method: —

Sampling Method: grab- submerge container Sample Time: 1940

7 jars Sample ID, Analysis, Preservatives: 16631-SW-5

Remarks: GPS: N. 58.69349 W. 150.67354 ± 11 ft

Sampling Personnel: Andrew Lee

WELL CASING VOLUMES

GAL/FT 1-1/4" = 0.077 2" = 0.16 3" = 0.37 4" = 0.65
1-1/2" = 0.10 2-1/2" = 0.24 3-1/2" = 0.50 6" = 1.46

PRODUCT RECOVERY AND MONITORING DATA

SHANNON & WILSON

Product Monitoring/Recovery Sumps and Points - Ongoing Monitoring Data

	Sump 1 (North Sump)	MP1	MP2	MP3	MP4	Sump 2 (South Sump)	MP5	MPA	MPB	MPC
Date of Measurement	5/12/14									→
Time of Measurement	1738	1732	1728	1721	1717	1711	1705	1650	1644	1639
Top of Casing Elevation (feet)	-	-	-	-	-	-	-	-	-	-
Depth to product (feet) (ASL)	~~9.20~~ none	8.89	none	none	none	none	none	none	none	none
Depth to water (feet) (ASL)	~~9.20~~ 9.21	8.91	none	none	none	8.94	none to 9.56	none	5.96	7.21
Depth to bottom (feet)	9.76	9.11	8.84	9.46	9.33	9.44	9.59	5.69	8.59	7.71
Total fluid thickness (feet)	0.56	0.22	0	0	0	0.50	dry to 0.03	0	2.63	0.50
Water thickness (feet) (ASL)	~~0.56~~ 0.55	0.20	0	0	0	0.50	dry to 0.03	0	2.63	0.50
Product Thickness (~~inches~~ ft.) (ASL)	0.01	0.02	0	0	0	0	0	0	0	0
Remarks	product →	8 in →	dry	dry	dry →		~~to bottom?~~ 8 in (ASL)	dry		

Product Removed:

Comments:

Anchorage

32-1-16631-~~008~~-011 (ASL) Product Recovery Monitoring, King Salmon, Alaska

1-11
Skimo Crk
Andrea Lee page 1
May 12, 2014 Monday

730 Call PenAir Cargo to check for arrival of cargo. 9 of 10 have been shipped. They can't tell me what item wasn't shipped but it may go on one of several flights this morning. Travel to Anchorage Airport in my car (starting miles 203502) Take PenAir to King Salmon. Should be able to do at least some of tasks with a ~~missing~~ (late) arriving cargo piece.
1105 Arrive - Pick up rental truck from Bob Egli / Eagle Eye (2 - maybe 3 days)
1125 Pick up cargo (all arrived)
1132 On site get decon water from Antlers Inn & put gel-ice in MB freezer (have Jim/Antlers)
1210 talk to Mike Swain let him know of sampling. He shows me well MW-5
1222 Start locating wells, inspecting, taking photos, measuring water levels, measuring swing ties
WEATHER: sunny, hot ~60°F, light wind
1233 Photo MW-2 No well cap or monument in sight, just well casing at ground level
- DTW 22.37' - No product (@ 1233)
- Swing ties: 55.6 to Eddie's SE corner / 67.0' to Eddies SW corner
- TD 22.93' used to be 26.10' → filled with soil
- recommend ~~installing flush monument, cutting down casing, installing well cap.~~ decommissioning. ~~↳ gravelly material (hard)~~
- Don't have a good way to protect well at the moment. It is located in high traffic area and a well cap could be pushed into well. (Don't have an extra well cap anyway)

1254 Photo MW-4 dug out - under 2" gravel - good condition
- DTW 25.13' @ 1258 No product
- swing ties: 114.4' to MW-2, 102' to MW-6, 105' to Eddies NE corner, 86' to Eddies SE corner
- label under lid of monument

1324 photo MW-6 well monument jacked up ~1.5" but intact & protective
1326 photo MW-6 well casing jacked, needs to be cut down.
- DTW 25.16' @ 13:29 No product
- Swing ties: 102' to MW-4, 45.2' to MW-5, 24.6' to Eddies NE corner, also 24.6' to SW corner of building to the east. Another measurement to Eddies not practical due to vehicles, entrance area
- label under monument lid

1341 photo MW-5 Mike Swain put steel ring over well & covered with bucket lid
1341 photo MW-5 looking at well inside ring. Good condition. Replaced 2 missing bolts.
- DTW 23.96' @ 1344 No product. HC odor.
- label under lid
- Swing ties: 29' to Eddies NE corner, 18.8' to Eddies NW corner, 45.2' to MW-6

1-11
[Eski]mo Creek
[A]ndrew Lee
Page 2
May 12, 2014 (Continued)

1409 photo MW-3 Good condition, Put a steel ring around well for easier location.
- DTW 23.59 @ 14:12 no product
- label under lid
- Swing ties: 40.9' to MW-1, 65.8' to Eddies NW corner, 102.1' to Eddies SW corner

1431 Photo MW-1 Good condition.
- DTW 23.93 @ 1437 No product
- label under lid
- Swing ties: 40.9' to MW-3, 25' to Eddies NW corner, 82' to Eddies SW corner

1454 Revegetated slope looking south from top
1500 looking West, water is pooled/static & dry in region of Surface water location SW3 this channel is drying up & ~~getting~~ filled, vegetated. Main channel is beyond to west
1506 Reveg. slope looking SE Sump 1 in foreground
1510 Reveg slope looking NE from creekside
1510 looking NNE along Eskimo Creek. No seeps visible below Sump 2 area. Surface water location SW-1 & SW-2
1514 looking S. Downstream surface water location.
1521 another look at SW-3 surface water location - pooled water looking west
1524 proposed upstream surface water location just upstream of split in Creek as it goes around an island looking S. Approx. west of Sump 1. Swing ties not practical through brush.
~~GPS location N58.68349° W 156.67357 (± 14 ft) about 95' west of Sump 2 on Figure.~~
1529 looking (E) back from proposed upstream surface water location at re-vegetated slope.
1530 looking NE up drying channel of SW-3 location from new upstream location.
1537 ~~Possibly~~ (ASC) R-7 ~~?~~ below MP3/MP4. 2.5' long, 4" diameter (Dry) returned to hole after photo ~~(wrong location)~~
1539 ~~Possibly~~ R6 ? below MP2/MP3. " " ~~(wrong location if figure is correct)~~.
1540 returned to hole, R6 ? MP2/MP3 in background. ← (Dry.)
locations of R6 & R7 & MPA, MPB, MPC appear to be shift on figure, based on 2004 Survey.

1631-11 Andrew Lee
Eskimo Creek
Page 3
May 12, 2014 Continued

1637 MPC photo flagged & labeled looking West
DTW 7.21 @ 1639 no product
TD 7.71
Swing ties: 44.8' to sump 1, 84.5' to sump 2

1642 photo MPB flagged & labeled looking west
DTW 5.96 @ 16:44 No product
TD 8.59
Swing ties: 18.7' to sump 1, 52' to sump 2

1648 photo MPA looking south flagged & labeled.
Total Depth 5.69' No water @ 1650
Swing ties: 21' to sump 1, 43' to sump 2

R7 Swing ties: to sump 2 = 21' to sump 1 : 38.5'
R6 swing ties to sump 2 = 31' to sump 1 : 27.5'
See previous page. both dry.

1701 looking South R6 foreground & R7 back both leaning ← photo —

1704 photo MP5 labeled & visible
DTW ~~9.54~~ 9.56 @ 1705 no product, water only on part of bottom 0.00' to 0.03' water
TD 9.59 possible ice on bottom (looking down into well) No: consistent with previous total depth

1710 photo ~~Sump 2~~ looking NE - labeled, visible
DTW 8.94 @ 1711 No product
TD 9.49

1714 photo MP4 labeled (reinked after photo), visible looking E
DTW: None @ 17:17 dry.
TD 9.33

1719 photo MP3 looking East labeled & visible
DTW: None @ 1721 dry
TD: 9.46

May 12, 2014 continued

1723 photo MP2 labeled, visible (looking ~~West~~ East (ASL))
DTW: none @ 17:28 dry
TD 8.84

1729 photo MP1 labeled, visible (looking ~~west~~ east ASL)
DTP 8.89 @1732 product visible on probe
DTW 8.91 > 0.02' product in monitoring point MP1
TD: 9.11

1736 photo Sump 1 looking NE. labeled & visible
~~DTW~~ DTP 9.20 @1738 ~~No product~~ ASL DTW 9.21 0.01' product,
TD 9.76 product residue visible on probe

~~well~~ points Not located (WP-1 & WP-3 on Figure)
1810 check in at Antlers Inn, call Tim to give update - Not in office
log into email to update
1934 Complete email update. (12.1 hrs day)

May 13, 2014 Tues
915 Check email for Tims reply - he has not talk to ADEC yet.
921 watch defensive driving video (off job 1.1 hr)
1035 calibrate YSI-556, prepare field forms, calculate well volumes
Weather: Sunny, light wind, 50s°F
- Sample MPC, MPB, MW-5 (MW-1 after 1630) with Email checks.
1630 Email & call Tim. Instructions received from ADEC:
Email check
- collect from MPB, MPC, MW-1, & MW-5 per work plan
- collect sample from sump 2
- move location of SW3 directly toward creek from bank rather than sample from ponded area
- Remove & dispose of R6 & R7 and fill in holes with local material.
- Well MW2 will be decommissioned and well MW-6 reported on another visit

16631-11 Eskimo Creek
Andrew Lee
Page 5
May 13, 2014 continued

- pH on YSI-556 #2 Baked at start of well MW-1. Switch to Hanna #1 (calibrated) for pH only to continue to use flow through cell.

- per Tim, GRO/BTEX/DRO/REO duplicate on MW-1
  PAH duplicate on Sump 2

- Sump 2 sample no purge ~~due~~ too shallow to pump low flow, hand many volume to purge one volume with bailer

- Sample surface water

1949 photo SW-5 upstream sample location, perpendicular out from bank from SW-3 location looking north GPS location N 58.68349, W 156.67354
Swing ties (by GPS): 142' to Sump 2, 116' to Sump 1, (412' to SW-3 ?)

2032 photo SW-4 downstream location slighty further downstream than proposed due to footing, looking Northeast GPS location N 58.68306 W 156.67331
Swing ties (by GPS): 67' to Sump 2, 109' to Sump 1

SW-1 also visible in photo below Sump 2
GPS location: N 58.68320 W 156.67306
Swing ties (by GPS): 19ft to Sump 2, 52' to Sump 1

- start packing up

- decommission R6 & R7

2115 R6 decommissioned. Hole filled with nearby soil, well disposed of in garbage. (photo)

2119 photo R7 decommission same way.

2235 Done Packing coolers with ice and gear packed up.

1663-11 Eskimo Creek
Andrew Lee
Page 6

May 13, 2014 To do at end of day
- Double check tasks in work plan
- tomorrow ship coolers & gear back by PenAir and IDW by NAC.
- Check out of Inn
- pay for extra day for vehicle
- see if I can get on 11:20 AM flight out if other tasks done
- fill out COC

Off for day 10:45 pm / 2245 (12.4 hr)

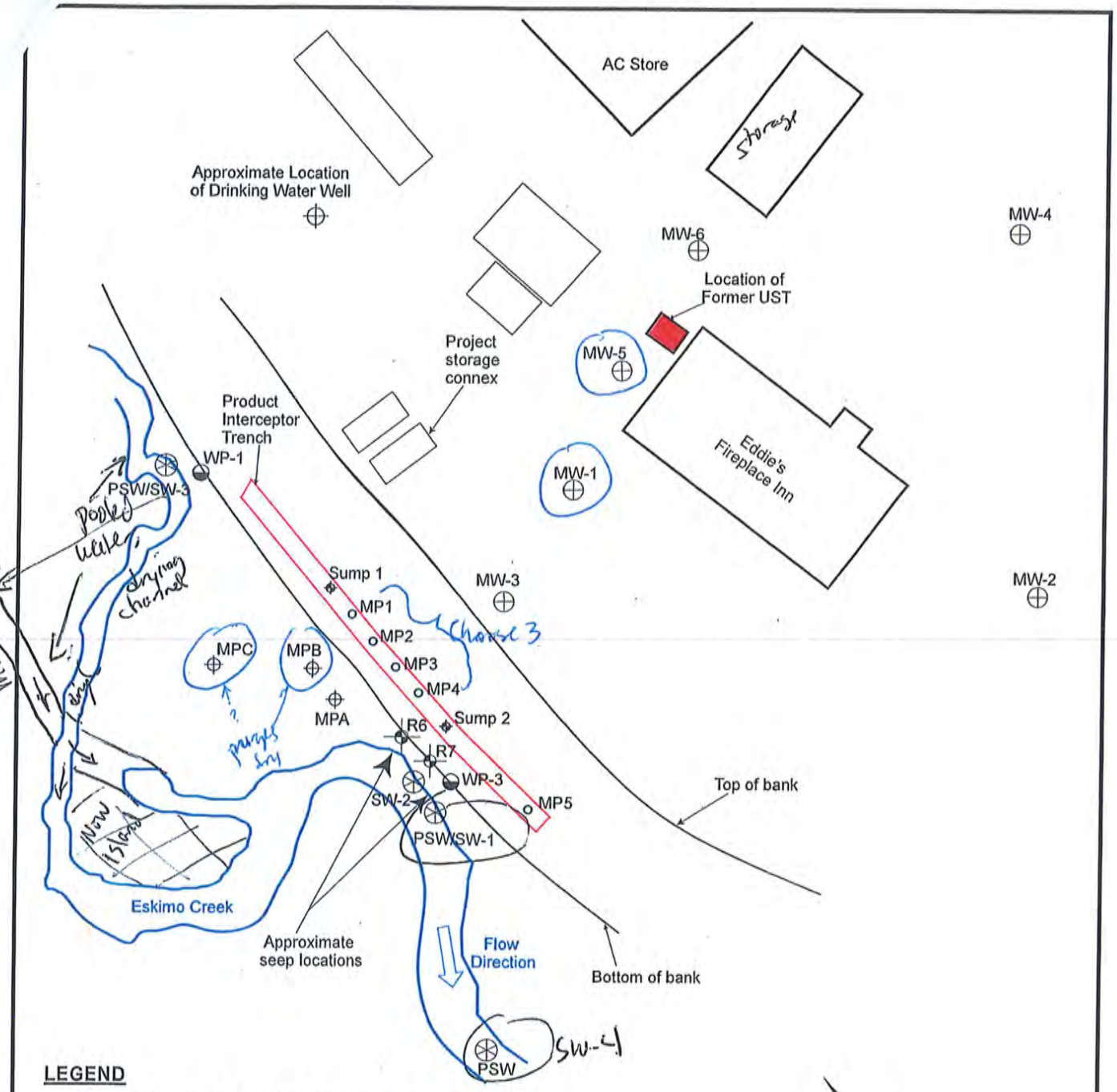
Wed May 14, 2014

800 Ship gear at PenAir - Penpacle 2 sample coolers, General freight - other gears.

900 Ship IDW drums to Anchorage / Emerald at NAC

reschedule return flight to 11:20.
Check out of Antlers Inn
Check in at airport
- Travel back to Anchorage
- pickup cargo - coolers & gear. (Missing one spare bottle cooler)
- Deliver Samples to SGS
- Demob at office
203519 mileage in car at office

1400 Done for day



LEGEND

PSW/SW-1	Proposed Surface Water Sample location and approximate location of Surface Water Sample SW-1 collected by Shannon & Wilson on October 1, 2004.
MW-1	Approximate location of Monitoring Well MW-1, installed by Hart Crowser in November 1999.
R6	Approximate location of Former Recovery Well R6, installed by Philip Services Corp. in 1999
WP-3	Approximate location of Former Well Point WP-3, installed by Hart Crowser on June 25, 1999
Sump 1	Approximate location of product recovery sump, installed by Shannon & Wilson in November 2001.
MP4	Approximate location of Monitoring Point MP4 installed by Shannon & Wilson in November 2001.
MPA	Approximate location of Monitoring Point MPA, installed by Shannon & Wilson in October 2002

Eskimo Creek
King Salmon, Alaska

SITE PLAN

November 2013 32-2-14628

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NAME Eskimo Creek JOB NO.
SUBJECT Well repair DATE 6/11/14
BY JCT CHK'D SHEET 1 of 1

1330: Steve Thomas and I mob to site to repair and decommission wells.

Well MW-6 was repaired by cutting ~2" of well casing off and pushing down the flush mount monument. See photos for repaired well.

Next Well MW-2 was ~~repaired~~ decommissioned. First the water level was checked to determine how much sand needed to be poured in. Hand tools were used to dig around the well casing so it could be cut down. Sand was added to above the water column. to approx. 17' bgs. Bentonite chips were poured in until approx. 5' bgs. A well cut off tool was used to remove approx. 3' of well casing. (As much as we could reach). Then sand/gravel was placed over the bentonite to match the ground surface.

APPENDIX C

RESULTS OF ANALYTICAL TESTING BY

SGS NORTH AMERICA INC. AND

ADEC LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

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

Report Number: **1141903**

Client Project: **32-1-16631-11 Eskimo Creek**

Dear Andrew Lee,

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 five 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 Victoria 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.

Victoria Pennick
2014.05.23
10:46:02 -08'00'

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Print Date: 05/22/2014 8:47:05AM

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1141903**
Project Name/Site: **32-1-16631-11 Eskimo Creek**
Project Contact: **Andrew Lee**

Refer to sample receipt form for information on sample condition.

16631-MW-1 (1141903001) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - The pattern is consistent with a weathered gasoline.

16631-MW-7 (1141903003) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.
AK102 - The pattern is consistent with a weathered gasoline.

16631-MPB (1141903004) PS

AK102 - Unknown hydrocarbon with several peaks is present.

16631-MPC (1141903005) PS

AK102 - Unknown hydrocarbon with several peaks is present.

16631-Sump2 (1141903006) PS

8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

16631-Sump3 (1141903007) PS

8270D SIM - Surrogate (2-fluorobiphenyl) recovery is outside of QC criteria due to sample dilution.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

*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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

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) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
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
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
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
16631-MW-1	1141903001	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-MW-5	1141903002	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-MW-7	1141903003	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-MPB	1141903004	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-MPC	1141903005	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-Sump2	1141903006	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-Sump3	1141903007	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-SW-1	1141903008	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-SW-4	1141903009	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-SW-5	1141903010	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)
16631-TB	1141903011	05/13/2014	05/14/2014	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIMS (PAH)	8270 PAH SIM Semi-Vol GC/MS Liq/Liq ext.
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water

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: **16631-MW-1**
Lab Sample ID: 1141903001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	2.67	mg/L
	Residual Range Organics	0.322J	mg/L
Volatile Fuels	Benzene	52.7	ug/L
	Ethylbenzene	76.2	ug/L
	Gasoline Range Organics	1.09	mg/L
	o-Xylene	72.8	ug/L
	P & M -Xylene	112	ug/L
	Toluene	0.580J	ug/L

Client Sample ID: **16631-MW-5**
Lab Sample ID: 1141903002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.276J	mg/L
Volatile Fuels	Benzene	1.68	ug/L
	Ethylbenzene	3.80	ug/L
	Gasoline Range Organics	0.0991J	mg/L
	o-Xylene	1.71	ug/L
	P & M -Xylene	3.50	ug/L

Client Sample ID: **16631-MW-7**
Lab Sample ID: 1141903003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	3.09	mg/L
	Residual Range Organics	0.648	mg/L
Volatile Fuels	Benzene	55.6	ug/L
	Ethylbenzene	86.0	ug/L
	Gasoline Range Organics	1.22	mg/L
	o-Xylene	81.5	ug/L
	P & M -Xylene	128	ug/L
	Toluene	0.530J	ug/L

Client Sample ID: **16631-MPB**
Lab Sample ID: 1141903004

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.19	mg/L
	Residual Range Organics	0.365J	mg/L
Volatile Fuels	Benzene	1.71	ug/L
	Ethylbenzene	0.850J	ug/L
	Gasoline Range Organics	0.0391J	mg/L
	o-Xylene	0.890J	ug/L
	P & M -Xylene	1.75J	ug/L

Client Sample ID: **16631-MPC**
Lab Sample ID: 1141903005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.25	mg/L
	Residual Range Organics	0.271J	mg/L
Volatile Fuels	Benzene	0.330J	ug/L
	o-Xylene	0.560J	ug/L
	P & M -Xylene	0.960J	ug/L

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Detectable Results Summary

Client Sample ID: **16631-Sump2**
Lab Sample ID: 1141903006

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	71.7	ug/L
	Acenaphthene	4.73	ug/L
	Anthracene	1.05	ug/L
	Fluorene	9.54	ug/L
	Phenanthrene	5.16	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	66.8	mg/L
	Residual Range Organics	2.04	mg/L
Volatile Fuels	Benzene	1.11	ug/L
	Ethylbenzene	7.91	ug/L
	Gasoline Range Organics	0.198	mg/L
	o-Xylene	2.79	ug/L
	P & M -Xylene	3.49	ug/L

Client Sample ID: **16631-Sump3**
Lab Sample ID: 1141903007

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	69.7	ug/L
	Acenaphthene	3.22	ug/L
	Anthracene	0.683	ug/L
	Fluorene	6.68	ug/L
	Phenanthrene	3.59	ug/L

Client Sample ID: **16631-SW-1**
Lab Sample ID: 1141903008

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.0197J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.201J	mg/L
	Residual Range Organics	0.205J	mg/L
Volatile Fuels	Ethylbenzene	0.450J	ug/L
	o-Xylene	0.510J	ug/L
	P & M -Xylene	0.910J	ug/L

Client Sample ID: **16631-SW-4**
Lab Sample ID: 1141903009

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Naphthalene	0.0403J	ug/L
Semivolatile Organic Fuels	Residual Range Organics	0.177J	mg/L
Volatile Fuels	P & M -Xylene	0.880J	ug/L

Client Sample ID: **16631-SW-5**
Lab Sample ID: 1141903010

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Naphthalene	0.0447J	ug/L
Volatile Fuels	P & M -Xylene	0.890J	ug/L

Client Sample ID: **16631-TB**
Lab Sample ID: 1141903011

	Parameter	Result	Units
Volatile Fuels	o-Xylene	0.500J	ug/L
	P & M -Xylene	0.880J	ug/L

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Results of **16631-MW-1**

Client Sample ID: **16631-MW-1**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903001
Lab Project ID: 1141903

Collection Date: 05/13/14 17:35
Received Date: 05/14/14 13:33
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	2.67		0.600	0.180	mg/L	1		05/20/14 12:29
Surrogates								
5a Androstane	84		50-150		%	1		05/20/14 12:29

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 12:29
Container ID: 1141903001-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.322	J	0.500	0.150	mg/L	1		05/20/14 12:29
Surrogates								
n-Triacontane-d62	90.2		50-150		%	1		05/20/14 12:29

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 12:29
Container ID: 1141903001-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **16631-MW-1**

Client Sample ID: **16631-MW-1**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903001
Lab Project ID: 1141903

Collection Date: 05/13/14 17:35
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.09		0.100	0.0310	mg/L	1		05/19/14 12:16
Surrogates								
4-Bromofluorobenzene	236	*	50-150		%	1		05/19/14 12:16

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 12:16
Container ID: 1141903001-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	52.7		0.500	0.150	ug/L	1		05/19/14 12:16
Ethylbenzene	76.2		1.00	0.310	ug/L	1		05/19/14 12:16
o-Xylene	72.8		1.00	0.310	ug/L	1		05/19/14 12:16
P & M -Xylene	112		2.00	0.620	ug/L	1		05/19/14 12:16
Toluene	0.580	J	1.00	0.310	ug/L	1		05/19/14 12:16
Surrogates								
1,4-Difluorobenzene	98.8		77-115		%	1		05/19/14 12:16

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 12:16
Container ID: 1141903001-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 05/22/2014 8:47:07AM

Results of **16631-MW-5**

Client Sample ID: **16631-MW-5**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903002
Lab Project ID: 1141903

Collection Date: 05/13/14 16:00
Received Date: 05/14/14 13:33
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	0.276	J	0.600	0.180	mg/L	1		05/20/14 12:48
Surrogates								
5a Androstane	78.6		50-150		%	1		05/20/14 12:48

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 12:48
Container ID: 1141903002-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.250	U	0.500	0.150	mg/L	1		05/20/14 12:48
Surrogates								
n-Triacontane-d62	84.5		50-150		%	1		05/20/14 12:48

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 12:48
Container ID: 1141903002-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **16631-MW-5**

Client Sample ID: **16631-MW-5**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903002
Lab Project ID: 1141903

Collection Date: 05/13/14 16:00
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0991	J	0.100	0.0310	mg/L	1		05/19/14 12:35
Surrogates								
4-Bromofluorobenzene	107		50-150		%	1		05/19/14 12:35

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 12:35
Container ID: 1141903002-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.68		0.500	0.150	ug/L	1		05/19/14 12:35
Ethylbenzene	3.80		1.00	0.310	ug/L	1		05/19/14 12:35
o-Xylene	1.71		1.00	0.310	ug/L	1		05/19/14 12:35
P & M -Xylene	3.50		2.00	0.620	ug/L	1		05/19/14 12:35
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 12:35
Surrogates								
1,4-Difluorobenzene	88.6		77-115		%	1		05/19/14 12:35

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 12:35
Container ID: 1141903002-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **16631-MW-7**

Client Sample ID: **16631-MW-7**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903003
Lab Project ID: 1141903

Collection Date: 05/13/14 17:45
Received Date: 05/14/14 13:33
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	3.09		0.600	0.180	mg/L	1		05/20/14 13:08
Surrogates								
5a Androstane	91.2		50-150		%	1		05/20/14 13:08

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 13:08
Container ID: 1141903003-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.648		0.500	0.150	mg/L	1		05/20/14 13:08
Surrogates								
n-Triacontane-d62	98.3		50-150		%	1		05/20/14 13:08

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 13:08
Container ID: 1141903003-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **16631-MW-7**

Client Sample ID: **16631-MW-7**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903003
Lab Project ID: 1141903

Collection Date: 05/13/14 17:45
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.22		0.100	0.0310	mg/L	1		05/19/14 12:54
Surrogates								
4-Bromofluorobenzene	253	*	50-150		%	1		05/19/14 12:54

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 12:54
Container ID: 1141903003-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	55.6		0.500	0.150	ug/L	1		05/19/14 12:54
Ethylbenzene	86.0		1.00	0.310	ug/L	1		05/19/14 12:54
o-Xylene	81.5		1.00	0.310	ug/L	1		05/19/14 12:54
P & M -Xylene	128		2.00	0.620	ug/L	1		05/19/14 12:54
Toluene	0.530	J	1.00	0.310	ug/L	1		05/19/14 12:54
Surrogates								
1,4-Difluorobenzene	101		77-115		%	1		05/19/14 12:54

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 12:54
Container ID: 1141903003-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **16631-MPB**

Client Sample ID: **16631-MPB**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903004
Lab Project ID: 1141903

Collection Date: 05/13/14 13:55
Received Date: 05/14/14 13:33
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	1.19		0.600	0.180	mg/L	1		05/20/14 13:28
Surrogates								
5a Androstane	77.5		50-150		%	1		05/20/14 13:28

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 13:28
Container ID: 1141903004-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.365	J	0.500	0.150	mg/L	1		05/20/14 13:28
Surrogates								
n-Triacontane-d62	86.2		50-150		%	1		05/20/14 13:28

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 13:28
Container ID: 1141903004-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **16631-MPB**

Client Sample ID: **16631-MPB**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903004
Lab Project ID: 1141903

Collection Date: 05/13/14 13:55
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0391	J	0.100	0.0310	mg/L	1		05/19/14 13:52
Surrogates								
4-Bromofluorobenzene	91.5		50-150		%	1		05/19/14 13:52

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 13:52
Container ID: 1141903004-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.71		0.500	0.150	ug/L	1		05/19/14 13:52
Ethylbenzene	0.850	J	1.00	0.310	ug/L	1		05/19/14 13:52
o-Xylene	0.890	J	1.00	0.310	ug/L	1		05/19/14 13:52
P & M -Xylene	1.75	J	2.00	0.620	ug/L	1		05/19/14 13:52
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 13:52
Surrogates								
1,4-Difluorobenzene	92.5		77-115		%	1		05/19/14 13:52

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 13:52
Container ID: 1141903004-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 05/22/2014 8:47:07AM

Results of **16631-MPC**

Client Sample ID: **16631-MPC**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903005
Lab Project ID: 1141903

Collection Date: 05/13/14 13:00
Received Date: 05/14/14 13:33
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	1.25		0.600	0.180	mg/L	1		05/20/14 13:47
Surrogates								
5a Androstane	80.5		50-150		%	1		05/20/14 13:47

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 13:47
Container ID: 1141903005-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.271	J	0.500	0.150	mg/L	1		05/20/14 13:47
Surrogates								
n-Triacontane-d62	82.5		50-150		%	1		05/20/14 13:47

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 13:47
Container ID: 1141903005-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **16631-MPC**

Client Sample ID: **16631-MPC**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903005
Lab Project ID: 1141903

Collection Date: 05/13/14 13:00
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		05/19/14 14:11
Surrogates								
4-Bromofluorobenzene	86.2		50-150		%	1		05/19/14 14:11

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 14:11
Container ID: 1141903005-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.330	J	0.500	0.150	ug/L	1		05/19/14 14:11
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/19/14 14:11
o-Xylene	0.560	J	1.00	0.310	ug/L	1		05/19/14 14:11
P & M -Xylene	0.960	J	2.00	0.620	ug/L	1		05/19/14 14:11
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 14:11
Surrogates								
1,4-Difluorobenzene	94.3		77-115		%	1		05/19/14 14:11

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 14:11
Container ID: 1141903005-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **16631-Sump2**

Client Sample ID: **16631-Sump2**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903006
Lab Project ID: 1141903

Collection Date: 05/13/14 18:45
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	71.7		2.72	0.815	ug/L	50		05/19/14 16:05
2-Methylnaphthalene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Acenaphthene	4.73		0.272	0.0815	ug/L	5		05/17/14 15:39
Acenaphthylene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Anthracene	1.05		0.272	0.0815	ug/L	5		05/17/14 15:39
Benzo(a)Anthracene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Benzo[a]pyrene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Benzo[b]Fluoranthene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Benzo[g,h,i]perylene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Benzo[k]fluoranthene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Chrysene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Dibenzo[a,h]anthracene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Fluoranthene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Fluorene	9.54		0.272	0.0815	ug/L	5		05/17/14 15:39
Indeno[1,2,3-c,d] pyrene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Naphthalene	0.272	U	0.543	0.168	ug/L	5		05/17/14 15:39
Phenanthrene	5.16		0.272	0.0815	ug/L	5		05/17/14 15:39
Pyrene	0.136	U	0.272	0.0815	ug/L	5		05/17/14 15:39
Surrogates								
2-Fluorobiphenyl	385	*	50-110		%	5		05/17/14 15:39
Terphenyl-d14	106		50-135		%	5		05/17/14 15:39

Batch Information

Analytical Batch: XMS8040
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/17/14 15:39
Container ID: 1141903006-F

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 920 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS8044
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/19/14 16:05
Container ID: 1141903006-F

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 920 mL
Prep Extract Vol: 1 mL

Results of **16631-Sump2**

Client Sample ID: **16631-Sump2**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903006
Lab Project ID: 1141903

Collection Date: 05/13/14 18:45
Received Date: 05/14/14 13:33
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	66.8		2.40	0.720	mg/L	4		05/20/14 15:26
Surrogates								
5a Androstane	83.7		50-150		%	4		05/20/14 15:26

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 15:26
Container ID: 1141903006-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	2.04		0.500	0.150	mg/L	1		05/20/14 14:07
Surrogates								
n-Triacontane-d62	93.8		50-150		%	1		05/20/14 14:07

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 14:07
Container ID: 1141903006-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **16631-Sump2**

Client Sample ID: **16631-Sump2**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903006
Lab Project ID: 1141903

Collection Date: 05/13/14 18:45
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.198		0.100	0.0310	mg/L	1		05/19/14 14:30
Surrogates								
4-Bromofluorobenzene	110		50-150		%	1		05/19/14 14:30

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 14:30
Container ID: 1141903006-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.11		0.500	0.150	ug/L	1		05/19/14 14:30
Ethylbenzene	7.91		1.00	0.310	ug/L	1		05/19/14 14:30
o-Xylene	2.79		1.00	0.310	ug/L	1		05/19/14 14:30
P & M -Xylene	3.49		2.00	0.620	ug/L	1		05/19/14 14:30
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 14:30
Surrogates								
1,4-Difluorobenzene	89		77-115		%	1		05/19/14 14:30

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 14:30
Container ID: 1141903006-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **16631-Sump3**

Client Sample ID: **16631-Sump3**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903007
Lab Project ID: 1141903

Collection Date: 05/13/14 18:55
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	69.7		2.55	0.765	ug/L	50		05/19/14 16:21
2-Methylnaphthalene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Acenaphthene	3.22		0.255	0.0765	ug/L	5		05/17/14 15:55
Acenaphthylene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Anthracene	0.683		0.255	0.0765	ug/L	5		05/17/14 15:55
Benzo(a)Anthracene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Benzo[a]pyrene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Benzo[b]Fluoranthene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Benzo[g,h,i]perylene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Benzo[k]fluoranthene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Chrysene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Dibenzo[a,h]anthracene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Fluoranthene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Fluorene	6.68		0.255	0.0765	ug/L	5		05/17/14 15:55
Indeno[1,2,3-c,d] pyrene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Naphthalene	0.255	U	0.510	0.158	ug/L	5		05/17/14 15:55
Phenanthrene	3.59		0.255	0.0765	ug/L	5		05/17/14 15:55
Pyrene	0.128	U	0.255	0.0765	ug/L	5		05/17/14 15:55
Surrogates								
2-Fluorobiphenyl	272	*	50-110		%	5		05/17/14 15:55
Terphenyl-d14	96		50-135		%	5		05/17/14 15:55

Batch Information

Analytical Batch: XMS8040
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/17/14 15:55
Container ID: 1141903007-A

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS8044
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/19/14 16:21
Container ID: 1141903007-A

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL

Results of **16631-SW-1**

Client Sample ID: **16631-SW-1**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903008
Lab Project ID: 1141903

Collection Date: 05/13/14 20:05
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0197	J	0.0521	0.0156	ug/L	1		05/17/14 16:11
2-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Acenaphthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Acenaphthylene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Benzo(a)Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Benzo[a]pyrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Benzo[b]Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Benzo[g,h,i]perylene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Benzo[k]fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Chrysene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Dibenzo[a,h]anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Fluorene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Indeno[1,2,3-c,d] pyrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Naphthalene	0.0520	U	0.104	0.0323	ug/L	1		05/17/14 16:11
Phenanthrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Pyrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:11
Surrogates								
2-Fluorobiphenyl	81.7		50-110		%	1		05/17/14 16:11
Terphenyl-d14	96		50-135		%	1		05/17/14 16:11

Batch Information

Analytical Batch: XMS8040
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/17/14 16:11
Container ID: 1141903008-F

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 960 mL
Prep Extract Vol: 1 mL

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Results of **16631-SW-1**

Client Sample ID: **16631-SW-1**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903008
Lab Project ID: 1141903

Collection Date: 05/13/14 20:05
Received Date: 05/14/14 13:33
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	0.201	J	0.600	0.180	mg/L	1		05/20/14 14:27
Surrogates								
5a Androstane	83.7		50-150		%	1		05/20/14 14:27

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 14:27
Container ID: 1141903008-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.205	J	0.500	0.150	mg/L	1		05/20/14 14:27
Surrogates								
n-Triacontane-d62	90.2		50-150		%	1		05/20/14 14:27

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 14:27
Container ID: 1141903008-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **16631-SW-1**

Client Sample ID: **16631-SW-1**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903008
Lab Project ID: 1141903

Collection Date: 05/13/14 20:05
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		05/19/14 14:49
Surrogates								
4-Bromofluorobenzene	86.7		50-150		%	1		05/19/14 14:49

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 14:49
Container ID: 1141903008-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		05/19/14 14:49
Ethylbenzene	0.450	J	1.00	0.310	ug/L	1		05/19/14 14:49
o-Xylene	0.510	J	1.00	0.310	ug/L	1		05/19/14 14:49
P & M -Xylene	0.910	J	2.00	0.620	ug/L	1		05/19/14 14:49
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 14:49
Surrogates								
1,4-Difluorobenzene	93.5		77-115		%	1		05/19/14 14:49

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 14:49
Container ID: 1141903008-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **16631-SW-4**

Client Sample ID: **16631-SW-4**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903009
Lab Project ID: 1141903

Collection Date: 05/13/14 20:25
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
2-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Acenaphthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Acenaphthylene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Benzo(a)Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Benzo[a]pyrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Benzo[b]Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Benzo[g,h,i]perylene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Benzo[k]fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Chrysene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Dibenzo[a,h]anthracene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Fluorene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Indeno[1,2,3-c,d] pyrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Naphthalene	0.0403	J	0.104	0.0323	ug/L	1		05/17/14 16:28
Phenanthrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Pyrene	0.0261	U	0.0521	0.0156	ug/L	1		05/17/14 16:28
Surrogates								
2-Fluorobiphenyl	78.3		50-110		%	1		05/17/14 16:28
Terphenyl-d14	95.3		50-135		%	1		05/17/14 16:28

Batch Information

Analytical Batch: XMS8040
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/17/14 16:28
Container ID: 1141903009-F

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 960 mL
Prep Extract Vol: 1 mL

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Results of **16631-SW-4**

Client Sample ID: **16631-SW-4**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903009
Lab Project ID: 1141903

Collection Date: 05/13/14 20:25
Received Date: 05/14/14 13:33
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	0.300	U	0.600	0.180	mg/L	1		05/20/14 14:47
Surrogates								
5a Androstane	85.6		50-150		%	1		05/20/14 14:47

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 14:47
Container ID: 1141903009-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.177	J	0.500	0.150	mg/L	1		05/20/14 14:47
Surrogates								
n-Triacontane-d62	93.5		50-150		%	1		05/20/14 14:47

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 14:47
Container ID: 1141903009-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **16631-SW-4**

Client Sample ID: **16631-SW-4**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903009
Lab Project ID: 1141903

Collection Date: 05/13/14 20:25
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		05/19/14 15:08
Surrogates								
4-Bromofluorobenzene	86.5		50-150		%	1		05/19/14 15:08

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 15:08
Container ID: 1141903009-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		05/19/14 15:08
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/19/14 15:08
o-Xylene	0.500	U	1.00	0.310	ug/L	1		05/19/14 15:08
P & M -Xylene	0.880	J	2.00	0.620	ug/L	1		05/19/14 15:08
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 15:08
Surrogates								
1,4-Difluorobenzene	92.3		77-115		%	1		05/19/14 15:08

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 15:08
Container ID: 1141903009-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **16631-SW-5**

Client Sample ID: **16631-SW-5**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903010
Lab Project ID: 1141903

Collection Date: 05/13/14 19:40
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
2-Methylnaphthalene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Acenaphthene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Acenaphthylene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Anthracene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Benzo(a)Anthracene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Benzo[a]pyrene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Benzo[b]Fluoranthene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Benzo[g,h,i]perylene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Benzo[k]fluoranthene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Chrysene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Dibenzo[a,h]anthracene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Fluoranthene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Fluorene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Indeno[1,2,3-c,d] pyrene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Naphthalene	0.0447	J	0.103	0.0320	ug/L	1		05/17/14 16:44
Phenanthrene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Pyrene	0.0257	U	0.0515	0.0155	ug/L	1		05/17/14 16:44
Surrogates								
2-Fluorobiphenyl	65.8		50-110		%	1		05/17/14 16:44
Terphenyl-d14	89.7		50-135		%	1		05/17/14 16:44

Batch Information

Analytical Batch: XMS8040
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 05/17/14 16:44
Container ID: 1141903010-F

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 05/16/14 09:35
Prep Initial Wt./Vol.: 970 mL
Prep Extract Vol: 1 mL

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Results of **16631-SW-5**

Client Sample ID: **16631-SW-5**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903010
Lab Project ID: 1141903

Collection Date: 05/13/14 19:40
Received Date: 05/14/14 13:33
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	0.300	U	0.600	0.180	mg/L	1		05/20/14 15:07
Surrogates								
5a Androstane	83.1		50-150		%	1		05/20/14 15:07

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 05/20/14 15:07
Container ID: 1141903010-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.250	U	0.500	0.150	mg/L	1		05/20/14 15:07
Surrogates								
n-Triacontane-d62	90.1		50-150		%	1		05/20/14 15:07

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Analyst: HM
Analytical Date/Time: 05/20/14 15:07
Container ID: 1141903010-D

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 05/15/14 09:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **16631-SW-5**

Client Sample ID: **16631-SW-5**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903010
Lab Project ID: 1141903

Collection Date: 05/13/14 19:40
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		05/19/14 15:27
Surrogates								
4-Bromofluorobenzene	89.4		50-150		%	1		05/19/14 15:27

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 15:27
Container ID: 1141903010-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		05/19/14 15:27
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/19/14 15:27
o-Xylene	0.500	U	1.00	0.310	ug/L	1		05/19/14 15:27
P & M -Xylene	0.890	J	2.00	0.620	ug/L	1		05/19/14 15:27
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 15:27
Surrogates								
1,4-Difluorobenzene	92.9		77-115		%	1		05/19/14 15:27

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 15:27
Container ID: 1141903010-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **16631-TB**

Client Sample ID: **16631-TB**
Client Project ID: **32-1-16631-11 Eskimo Creek**
Lab Sample ID: 1141903011
Lab Project ID: 1141903

Collection Date: 05/13/14 08:00
Received Date: 05/14/14 13:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		05/19/14 11:57
Surrogates								
4-Bromofluorobenzene	88.7		50-150		%	1		05/19/14 11:57

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 05/19/14 11:57
Container ID: 1141903011-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		05/19/14 11:57
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		05/19/14 11:57
o-Xylene	0.500	J	1.00	0.310	ug/L	1		05/19/14 11:57
P & M -Xylene	0.880	J	2.00	0.620	ug/L	1		05/19/14 11:57
Toluene	0.500	U	1.00	0.310	ug/L	1		05/19/14 11:57
Surrogates								
1,4-Difluorobenzene	92.6		77-115		%	1		05/19/14 11:57

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 05/19/14 11:57
Container ID: 1141903011-A

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 05/19/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1539761 [VXX/25862]
Blank Lab ID: 1210449

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010, 1141903011

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene	85.3	50-150		%

Batch Information

Analytical Batch: VFC11885
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 5/19/2014 9:25:00AM

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 5/19/2014 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1141903 [VXX25862]
Blank Spike Lab ID: 1210452
Date Analyzed: 05/19/2014 10:22

Spike Duplicate ID: LCSD for HBN 1141903 [VXX25862]
Spike Duplicate Lab ID: 1210453
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010, 1141903011

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.04	104	1.00	1.05	105	(60-120)	0.96	(< 20)
Surrogates									
4-Bromofluorobenzene	0.0500		94	0.0500		82	(50-150)	13.90	

Batch Information

Analytical Batch: **VFC11885**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX25862**
Prep Method: **SW5030B**
Prep Date/Time: **05/19/2014 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1539761 [VXX/25862]
Blank Lab ID: 1210449

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010, 1141903011

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene	93.6	77-115		%

Batch Information

Analytical Batch: VFC11885
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 5/19/2014 9:25:00AM

Prep Batch: VXX25862
Prep Method: SW5030B
Prep Date/Time: 5/19/2014 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1141903 [VXX25862]
Blank Spike Lab ID: 1210450
Date Analyzed: 05/19/2014 10:03

Spike Duplicate ID: LCSD for HBN 1141903 [VXX25862]
Spike Duplicate Lab ID: 1210451
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010, 1141903011

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	100	100	100	100	100	(80-120)	0.24	(< 20)
Ethylbenzene	100	102	102	100	105	105	(75-125)	2.40	(< 20)
o-Xylene	100	103	103	100	104	104	(80-120)	1.00	(< 20)
P & M -Xylene	200	206	103	200	210	105	(75-130)	2.00	(< 20)
Toluene	100	101	101	100	102	102	(75-120)	0.83	(< 20)
Surrogates									
1,4-Difluorobenzene	50		99	50		98	(77-115)	0.75	

Batch Information

Analytical Batch: **VFC11885**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX25862**
Prep Method: **SW5030B**
Prep Date/Time: **05/19/2014 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1533363 [XXX/31022]
Blank Lab ID: 1209716

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.205J	0.600	0.180	mg/L
Surrogates				
5a Androstane	79.3	60-120		%

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK102
Instrument: HP 7890A FID SV E R
Analyst: HM
Analytical Date/Time: 5/20/2014 11:29:00AM

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 5/15/2014 9:15:44AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1141903 [XXX31022]
Blank Spike Lab ID: 1209717
Date Analyzed: 05/20/2014 11:48

Spike Duplicate ID: LCSD for HBN 1141903 [XXX31022]
Spike Duplicate Lab ID: 1209718
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010

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	18.4	92	20	18.2	91	(75-125)	1.30	(< 20)
Surrogates									
5a Androstane	0.4		92	0.4		92	(60-120)	0.39	

Batch Information

Analytical Batch: **XFC11316**
Analytical Method: **AK102**
Instrument: **HP 7890A FID SV E R**
Analyst: **HM**

Prep Batch: **XXX31022**
Prep Method: **SW3520C**
Prep Date/Time: **05/15/2014 09:15**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1533363 [XXX/31022]
Blank Lab ID: 1209716

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.311J	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62	86.1	60-120		%

Batch Information

Analytical Batch: XFC11316
Analytical Method: AK103
Instrument: HP 7890A FID SV E R
Analyst: HM
Analytical Date/Time: 5/20/2014 11:29:00AM

Prep Batch: XXX31022
Prep Method: SW3520C
Prep Date/Time: 5/15/2014 9:15:44AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1141903 [XXX31022]
Blank Spike Lab ID: 1209717
Date Analyzed: 05/20/2014 11:48

Spike Duplicate ID: LCSD for HBN 1141903 [XXX31022]
Spike Duplicate Lab ID: 1209718
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1141903001, 1141903002, 1141903003, 1141903004, 1141903005, 1141903006, 1141903008, 1141903009, 1141903010

Results by **AK103**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	20	20.5	102	20	20.0	100	(60-120)	2.40	(< 20)
Surrogates									
n-Triacontane-d62	0.4		94	0.4		93	(60-120)	0.96	

Batch Information

Analytical Batch: **XFC11316**
Analytical Method: **AK103**
Instrument: **HP 7890A FID SV E R**
Analyst: **HM**

Prep Batch: **XXX31022**
Prep Method: **SW3520C**
Prep Date/Time: **05/15/2014 09:15**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1535761 [XXX/31028]
Blank Lab ID: 1209995

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1141903006, 1141903007, 1141903008, 1141903009, 1141903010

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0250U	0.0500	0.0150	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0250U	0.0500	0.0150	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Fluorobiphenyl	81.8	50-110		%
Terphenyl-d14	98.9	50-135		%

Batch Information

Analytical Batch: XMS8040
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: RTS
Analytical Date/Time: 5/17/2014 2:50:00PM

Prep Batch: XXX31028
Prep Method: SW3520C
Prep Date/Time: 5/16/2014 9:35:44AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1141903 [XXX31028]
Blank Spike Lab ID: 1209996
Date Analyzed: 05/17/2014 15:06

Spike Duplicate ID: LCSD for HBN 1141903 [XXX31028]
Spike Duplicate Lab ID: 1209997
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1141903006, 1141903007, 1141903008, 1141903009, 1141903010

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

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.5	0.315	63	0.5	0.340	68	(47-107)	7.60	(< 30)
2-Methylnaphthalene	0.5	0.275	55	0.5	0.296	59	(45-105)	7.10	(< 30)
Acenaphthene	0.5	0.314	63	0.5	0.325	65	(45-110)	3.30	(< 30)
Acenaphthylene	0.5	0.321	64	0.5	0.329	66	(50-105)	2.50	(< 30)
Anthracene	0.5	0.359	72	0.5	0.388	78	(55-110)	7.80	(< 30)
Benzo(a)Anthracene	0.5	0.388	78	0.5	0.409	82	(55-110)	5.30	(< 30)
Benzo[a]pyrene	0.5	0.333	67	0.5	0.354	71	(55-110)	6.10	(< 30)
Benzo[b]Fluoranthene	0.5	0.392	78	0.5	0.393	79	(45-120)	0.34	(< 30)
Benzo[g,h,i]perylene	0.5	0.303	61	0.5	0.310	62	(40-125)	2.30	(< 30)
Benzo[k]fluoranthene	0.5	0.385	77	0.5	0.390	78	(45-125)	1.30	(< 30)
Chrysene	0.5	0.403	81	0.5	0.410	82	(55-110)	1.60	(< 30)
Dibenzo[a,h]anthracene	0.5	0.299	60	0.5	0.291	58	(40-125)	2.80	(< 30)
Fluoranthene	0.5	0.385	77	0.5	0.407	81	(55-115)	5.60	(< 30)
Fluorene	0.5	0.341	68	0.5	0.345	69	(50-110)	1.20	(< 30)
Indeno[1,2,3-c,d] pyrene	0.5	0.330	66	0.5	0.325	65	(45-125)	1.40	(< 30)
Naphthalene	0.5	0.313	63	0.5	0.321	64	(40-100)	2.30	(< 30)
Phenanthrene	0.5	0.356	71	0.5	0.379	76	(50-115)	6.10	(< 30)
Pyrene	0.5	0.359	72	0.5	0.388	78	(50-130)	7.60	(< 30)
Surrogates									
2-Fluorobiphenyl	0.5		79	0.5		80	(50-110)	1.20	
Terphenyl-d14	0.5		96	0.5		100	(50-135)	4.00	

Batch Information

Analytical Batch: **XMS8040**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **RTS**

Prep Batch: **XXX31028**
Prep Method: **SW3520C**
Prep Date/Time: **05/16/2014 09:35**
Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.5 ug/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

1141903

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory SGS
Attn: Teri Pennick

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

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

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

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

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

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX (HCl) AK101/8021B	DRO/RRO (HCl) AK102/AK103	PAH 8270D SIM				Total Number of Containers	Remarks/Matrix
16631-MW-1	(1) A-E	1735	5/13/14		X	X	X					5	groundwater
16631-MW-5	(2) A-E	1600			X	X	X					5	
16631-MW-7	(3) A-E	1745			X	X	X					5	
16631-MPB	(4) A-E	1355			X	X	X					5	
16631-MPC	(5) A-E	1300			X	X	X					5	
16631-Sump2	(6) A-G	1845			X	X	X	X				7	
16631-Sump3	(7) A,B	1855			X			X				2	
16631-SW-1	(8) A-G	2005			X	X	X	X				7	surface water
16631-SW-4	(9) A-G	2025			X	X	X	X				7	
16631-SW-5	(10) A-G	1940			X	X	X	X				7	

Project Information	Sample Receipt
Project Number: 32-1-16631-11	Total Number of Containers
Project Name: Eskimo Creek	COC Seals/Intact? Y/N/NA
Contact: Andrew Lee/ Tim Terry	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method: in person VOAs & trip blank in cooler
Sampler: Andrew Lee	(attach shipping bill, if any)

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	ADEC level II deliverables

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Andrew Lee Time: 1333	Signature: Time:	Signature: Time:
Printed Name: Andrew Lee Date: 5/14/14	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: 13:33
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 5/14/14
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

4.7°C / # 238

No. 30296

1141903

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory SGS
Attn: Tom Pennick

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

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

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(907) 561-2120

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

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

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO/BTEX (8021B) AK101 / 8021B						Total Number of Containers	Remarks/Matrix
16631-TB	(11) A-C	800	5/13/14			X						1 box	trip blank

Project Information	Sample Receipt
Project Number: 32-1-16631-11	Total Number of Containers
Project Name: Eskimo Creek	COC Seals/Intact? Y/N/NA
Contact: Andrew Lee / Tim Terry	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method: in person
Sampler: Andrew Lee	(attach shipping bill, if any) VOAs & trip blank in some cooler

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	ADEC Level II deliverable

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Andrew Lee Time: 1333	Signature: Time:	Signature: Time:
Printed Name: ~~Andrew Lee~~ ANDREW LEE Date: 5/14/14	Printed Name: Date:	Printed Name: Date:
Company: ~~Shannon & Wilson~~ AECOM	Company:	Company:
Shannon & Wilson		

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 1333
Printed Name: Date:	Printed Name: Date:	Printed Name: Kayla Wagenfehr Date: 5/14/14
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

5.3°C/#203

No. 28782

SGS

1141903

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	hand delivered
Temperature blank compliant* (i.e., 0-6°C after CF)? ** Note: Exemption permitted for chilled samples collected less than 8 hours ago.* Cooler ID: 1 @ 4.7 w/ Therm.ID: 238 Cooler ID: 2 @ 5.3 w/ Therm.ID: 203 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ *Note: If non-compliant, use form FS-0029 to document affected samples/analyses.* If samples are 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." **If temperature(s) <0°C, were all sample containers ice free?**	(Yes) No N/A Yes No (N/A)	
Delivery method (specify all that apply): (Client) USPS Alert Courier C&D Delivery AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other: → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	Note ABN/ tracking # See Attached or (N/A) Yes No (N/A)	
→ For samples received with payment, note amount ($) and cash / check / CC (**circle one**) or note: N/A → For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed. SRF Initiated by: KMW N/A		
Were samples received within hold time? *Note: Refer to form F-083 "Sample Guide" for hold time information.* Do samples **match COC*** (i.e., sample IDs, dates/times collected)? ** Note: Exemption permitted if times differ <1hr; in that case, use times on COC.* Were analyses requested unambiguous?	(Yes) No N/A (Yes) No N/A (Yes) No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): (Bubble Wrap) Separate plastic bags Vermiculite Other:	(Yes) No N/A	
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	Yes (No) N/A Yes No (N/A)	(1) TB container large bubble
Were **proper containers** (type/mass/volume/preservative*) used? ** Note: Exemption permitted for waters to be analyzed for metals.* Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(Yes) No N/A (Yes) No N/A	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No (N/A)	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes (No) N/A (Yes) No N/A	16631-MW-1 (1H) adjusted Lot# LW09-0463-005-13 (1001E) KMW 5/14/14
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No (N/A)	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	Yes No (N/A)	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No (N/A)	SRF Completed by: KMW PM = N/A
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	(Yes) No N/A	Peer Reviewed by: KMW N/A
Additional notes (if applicable):		

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

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1141903001-A	HCL to pH < 2	OK
1141903001-B	HCL to pH < 2	OK
1141903001-C	HCL to pH < 2	OK
1141903001-D	HCL to pH < 2	OK
1141903001-E	HCL to pH < 2	PA
1141903002-A	HCL to pH < 2	OK
1141903002-B	HCL to pH < 2	OK
1141903002-C	HCL to pH < 2	OK
1141903002-D	HCL to pH < 2	OK
1141903002-E	HCL to pH < 2	OK
1141903003-A	HCL to pH < 2	OK
1141903003-B	HCL to pH < 2	OK
1141903003-C	HCL to pH < 2	OK
1141903003-D	HCL to pH < 2	OK
1141903003-E	HCL to pH < 2	OK
1141903004-A	HCL to pH < 2	OK
1141903004-B	HCL to pH < 2	OK
1141903004-C	HCL to pH < 2	OK
1141903004-D	HCL to pH < 2	OK
1141903004-E	HCL to pH < 2	OK
1141903005-A	HCL to pH < 2	OK
1141903005-B	HCL to pH < 2	OK
1141903005-C	HCL to pH < 2	OK
1141903005-D	HCL to pH < 2	OK
1141903005-E	HCL to pH < 2	OK
1141903006-A	HCL to pH < 2	OK
1141903006-B	HCL to pH < 2	OK
1141903006-C	HCL to pH < 2	OK
1141903006-D	HCL to pH < 2	OK
1141903006-E	HCL to pH < 2	OK
1141903006-F	No Preservative Required	OK
1141903006-G	No Preservative Required	OK
1141903007-A	No Preservative Required	OK
1141903007-B	No Preservative Required	OK
1141903008-A	HCL to pH < 2	OK
1141903008-B	HCL to pH < 2	OK
1141903008-C	HCL to pH < 2	OK
1141903008-D	HCL to pH < 2	OK
1141903008-E	HCL to pH < 2	OK
1141903008-F	No Preservative Required	OK
1141903008-G	No Preservative Required	OK
1141903009-A	HCL to pH < 2	OK
1141903009-B	HCL to pH < 2	OK
1141903009-C	HCL to pH < 2	OK
1141903009-D	HCL to pH < 2	OK
1141903009-E	HCL to pH < 2	OK
1141903009-F	No Preservative Required	OK
1141903009-G	No Preservative Required	OK
1141903010-A	HCL to pH < 2	OK
1141903010-B	HCL to pH < 2	OK
1141903010-C	HCL to pH < 2	OK
1141903010-D	HCL to pH < 2	OK
1141903010-E	HCL to pH < 2	OK
1141903010-F	No Preservative Required	OK
1141903010-G	No Preservative Required	OK
1141903011-A	HCL to pH < 2	OK
1141903011-B	HCL to pH < 2	OK
1141903011-C	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

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.

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

LABORATORY DATA REVIEW CHECKLIST

Completed by: Andrew Lee
Title: Environmental Scientist
Date: June 6, 2014

CS Report Name: Free-Phase Product, Groundwater, and Surface Water Monitoring, Eskimo Creek – Eddie's Fireplace Inn, King Salmon, Alaska
Laboratory Report Date: May 23, 2014

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.
Laboratory Report Number: 1141903

ADEC File Number: 2569.38.008
ADEC Hazard ID Number: 2152
(**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 (please explain)
Comments:

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (please explain)
Comments**:**

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

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (please explain)
Comments: *The cooler temperatures were 4.7° C and 5.3° C.*

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

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes / No / NA** (please explain)
Comments: *The laboratory noted that a VOA jar for Sample MW-1 contained a large bubble.*

d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? **Yes / No / NA** (please explain)
Comments: A *DRO/RRO jar for Sample MW-1 was received with pH outside the acceptable range.*

e. Data quality or usability affected? Please explain.
Comments: *The data are usable. The two other VOA jars provided sufficient volume for analysis and QC samples. Preservative added to the DRO/RRO jar at the laboratory brought the sample to the correct pH.*

4. Case Narrative

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

b. Discrepancies, errors or QC failures identified by the lab? **Yes / No / NA** (please explain)
Comments: *The AK101 BFB (surrogate) recovery for Samples MW-1 and MW-7 were biased high due to matrix interference. The 8270D SIM surrogate 2-fluorobiphenyl recovery for Samples Sump 2 and Sump 3 were outside QC criteria (biased high) due to sample dilution. PAH LOQs were elevated for Samples Sump 2 and Sump 3 due to sample dilution.*

c. Were corrective actions documented? **Yes / No / NA** (please explain)
Comments: *The PAH samples for Samples Sump 2 and Sump 3 were analyzed at dilution due to matrix interference with internal standards.*

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The case narrative does not describe the effect of biased high surrogates. However, the GRO results for Sample MW-1 and MW-7 and the PAH results for Samples Sump 2 and Sump 3 are potentially biased high. The PAH LOQs were elevated for Samples Sump 2 and Sump 3 due to sample dilution.*

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 LOQ for Benzo-a-pyrene is elevated above the Table C cleanup level for Samples Sump 2 and Sump 3, but the reported results are less than the Table C cleanup level.*

e. Data quality or usability affected? Please explain. **NA**
Comments:

6. QC Samples

a. Method Blank

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

ii. All method blank results less than LOQ? **Yes / No / NA** (please explain)
Comments: *The DRO and RRO method blank results of 0.205 J and 0.311 J mg/L, respectively, were less than LOQ, but some sample results were within five times the method blank result.*

iii. If above LOQ, what samples are affected?
Comments: *Samples MW-1, MW-7, MW-5, MPB, MPC, SW-1, and SW-4 are affected.*

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

v. Data quality or usability affected? Please explain.
Comments: *The DRO and/or RRO results for Samples MW-1, MW-7, MW-5, MPB, MPC, SW-1, and SW-4 are considered not detected at the LOQ, and are flagged with a "B" in the results table.*

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

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

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

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

iv. Precision – All relative percent differences (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? If so, are the data flags clearly defined? **Yes / No / NA** (please explain)
Comments:

vii. Data quality or usability affected? Please explain. **NA**
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: *The AK101 BFB (surrogate) recovery for Samples MW-1 and MW-7 were 236% and 253%, respectively. The 8270D SIM surrogate 2-fluorobiphenyl recovery for Samples Sump 2 and Sump 3 were 385% and 272%, respectively.*

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? **Yes / No / NA** (please explain)
Comments: *The failed surrogates were flagged. The project sample results were not flagged in the laboratory report.*

iv. Data quality or usability affected? Please explain.
Comments: *The affected sample results for MW-1, MW-7, Sump 2, and Sump 3 are potentially biased high and are flagged on Table 5.*

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

i. One trip blank reported per matrix, analysis and cooler? (If not, enter explanation below.) **Yes / No / NA** (please explain)
Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? **(**If not, a comment stating why must be entered below.) **Yes / No / NA** (please explain)
Comments:

iii. All results less than LOQ? **Yes / No / NA** (please explain)
Comments: *o-xylene and p&m-xylene were detected at estimated concentrations less than LOQ, but some project sample results were within 5 times the trip blank results.*

iv. If above LOQ, what samples are affected?
Comments**:** *Samples MW-5, MPB, MPC, Sump 2, SW-1, SW-4, and SW-5 are affected.*

v. Data quality or usability affected? Please explain.
Comments: *The total xylenes results for Samples MW-5, MPB, MPC, SW-1, SW-4, and SW-5 are considered not detected at the LOQ, and are flagged with a "B" in the results table. The p&m-xylenes result for Sample Sump 2 was considered not detected due to the trip blank detection, but the o-xylene result was valid. Therefore, the o-xylene result for Sample Sump 2 was reported as the total xylenes result.*

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA (please explain)
Comments: *Sample MW-7 is a duplicate of Sample MW-1 and Sample Sump 3 is a PAH duplicate of Sample Sump 2.*

ii. 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 acenaphthene, anthracene, fluorine, and phenanthrene RPDs were 38%, 42%, 35%, and 36%, respectively.*

iv. Data quality or usability affected? Please explain.
Comments: *The data is considered usable because the duplicate results were within a factor of two. The range of the analyte concentrations in each RPD DQO exceedance were less than ADEC cleanup levels and do not affect conclusions about the water quality.*

f. Decontamination or Equipment Blank
Yes / No / NA (please explain)
Comments: *A decontamination or equipment blank was not part of the ADEC approved proposal which served as the work plan. The monitoring wells were sampled in order from less contaminated to more contaminated. The monitoring points and sump were sampled with dedicated bailers.*

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

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

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

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

a. Defined and appropriate? **Yes / No / NA** (please explain)
Comments: *A key is provided on page 3 of the SGS laboratory report.*

APPENDIX D

INVESTIGATION DERIVED WASTE DISPOSAL DOCUMENATION

CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: EDDIE'S FIREPLACE INN
NAKNEK-KING SLAMON ROAD
KING SALMON AK 99613

DISPOSAL FACILITY: EMERALD ALASKA, INC.
2020 VIKING DRIVE
ANCHORAGE AK 99501

EPA ID NUMBER: CESQG
MANIFEST/DOCUMENT #: 21995
DATE OF DISPOSAL/RECYCLE: 05/29/2014

LINE	WASTE DESCRIPTION	CONTAINERS	TYPE	QUANTITY	UOM
1	IDW DECON WATER	1	DM	200	P

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

PREPARED BY: PATRICIA BEASLEY

SIGNATURE: Patricia J Beasley **DATE:** 5/29/2014

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** AK21995 (RP)

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. C E S Q G

Manifest Document No. 21995

2. Page 1 of 1

3. Generator's Name and Mailing Address
EDDIE'S FIREPLACE INN
NAKNEK-KING SLAMON ROAD
KING SALMON, AK 99613

Site Address
EDDIE'S FIREPLACE INN
NAKNEK-KING SLAMON ROAD
KING SALMON, AK 99613

ANDREW LEE

4. Generator's Phone (907) 561-2120

5. Transporter 1 Company Name: NORTHERN AIR CARGO, INC.
6. US EPA ID Number: A K D 0 0 3 8 4 5 5 2 6
A. State Transporter's ID
B. Transporter 1 Phone: (800) 478-3330

7. Transporter 2 Company Name: EMERALD ALASKA, INC
8. US EPA ID Number: A K R 0 0 0 0 0 4 1 8 4
C. State Transporter's ID
D. Transporter 2 Phone: (907) 258-1558

9. Designated Facility Name and Site Address
EMERALD ALASKA, INC.
2020 VIKING DRIVE
ANCHORAGE, AK 99501
10. US EPA ID Number: A K R 0 0 0 0 0 4 1 8 4
E. State Facility's ID
F. Facility's Phone: (907) 258-1558

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. MATERIAL NOT REGULATED BY D.O.T.	1	DM	200	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) EA0302 IDW DECON WATER

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Andrew Lee/Sherman & Wilson for Eddie's Fireplace Inn
Signature: Andrew Lee
Date: Month 5 Day 14 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BARBARA BROWN NAC
Signature: Barbara Brown
Date: Month 5 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Josh Sherwood
Signature: Josh Sherwood
Date: Month 5 Day 20 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Patricia L. Beasley
Signature: Patricia L. Beasley
Date: Month 05 Day 29 Year 14

NON-HAZARDOUS WASTE

CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: EDDIE'S FIREPLACE INN
NAKNEK-KING SLAMON ROAD
KING SALMON AK 99613

DISPOSAL FACILITY: EMERALD ALASKA, INC.
2020 VIKING DRIVE
ANCHORAGE AK 99501

EPA ID NUMBER: CESQG
MANIFEST/DOCUMENT #: 22189
DATE OF DISPOSAL/RECYCLE: 07/17/2014

LINE	WASTE DESCRIPTION	CONTAINERS	TYPE	QUANTITY	UOM
1	DIESEL FUEL	1	DM	200	P

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

PREPARED BY: PATRICIA BEASLEY

SIGNATURE: Patricia L Beasley **DATE:** 7/17/2014

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

AK22189 (RP)

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. C E S Q G

Manifest Document No. 2 2 1 8 9

2. Page 1 of 1

3. Generator's Name and Mailing Address
EDDIE'S FIREPLACE INN
NAKNEK-KING SLAMON ROAD
KING SALMON, AK 99613

Site Address
EDDIE'S FIREPLACE INN
NAKNEK-KING SLAMON ROAD
KING SALMON, AK 99613
ANDREW LEE

4. Generator's Phone ( ) (907) 561-2120

5. Transporter 1 Company Name: NORTHERN AIR CARGO, INC.

6. US EPA ID Number: A K D 0 0 3 8 4 5 5 2 6

A. State Transporter's ID

B. Transporter 1 Phone: (800) 478-3330

7. Transporter 2 Company Name: EMERALD ALASKA, INC

8. US EPA ID Number: A K R 0 0 0 0 0 4 1 8 4

C. State Transporter's ID

D. Transporter 2 Phone: (907) 258-1558

9. Designated Facility Name and Site Address
EMERALD ALASKA, INC.
2020 VIKING DRIVE
ANCHORAGE, AK 99501

10. US EPA ID Number: A K R 0 0 0 0 0 4 1 8 4

E. State Facility's ID

F. Facility's Phone: (907) 258-1558

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
HM NA1993, DIESEL FUEL, 3, PGIII, ERG#128 X	1	DM	200	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) EA0202 DIESEL FUEL

H. Handling Codes for Wastes Listed Above
1) H050

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Andrew Lee / Shannon Erickson for Eddie's Fireplace Inn
Signature: Andrew Lee
Date: Month 6 Day 2 Year 2014

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name:
Signature:
Date: Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Julia Niedermeyer Josi Shannon
Signature: Julia Niedermeyer
Date: Month 6 Day 23 Year 14
6/26/14

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Patricia L. Beasley
Signature: Patricia L. Beasley
Date: Month 7 Day 1 Year 14

GENERATOR
TRANSPORTER
FACILITY
NON-HAZARDOUS WASTE

APPENDIX E

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 32-1-16631-011

Date:	August 2014
To:	Alaska Department of Environmental Conservation
Re:	Free-Phase Product, Groundwater, and Surface Water Monitoring, Eskimo Creek – Eddie's Fireplace Inn, King Salmon, Alaska

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