

December 12, 2008

Municipality of Anchorage
Project Maintenance and Engineering
P.O. Box 196650
Anchorage, Alaska 99519-6650

Attn: Mr. Kurt Steinert

**RE: MONITORING WELL INSTALLATION, ANCHORAGE FIRE DEPARTMENT
STATION NO. 4, 4350 MACINNES STREET, ANCHORAGE, ALASKA ADEC
RECKEY NUMBER 1994210024503, EVENT ID #00407**

We are pleased to submit herein our report on site investigation activities at the Anchorage Fire Department Station No. 4, 4350 MacInnes Street, Anchorage, Alaska.

The purpose of this project is to sample soil and groundwater to assess remaining impact from the former UST. The evaluation was requested by Mr. Bill Petrik of the ADEC, in a letter to Mr. Kurt Steinert of the Municipality of Anchorage (MOA) dated November 29, 2007. The work was conducted in material accordance with the 18 Alaska Administrative Code (AAC) 75 Oil and Other Hazardous Substances (July 2008) regulations and our July 2, 2008 ADEC-approved work plan. Authorization to proceed with this project was provided by Mr. Michael Krueger of the Municipality of Anchorage (MOA) via a signed proposal dated June 11, 2008.

BACKGROUND

A 5,000-gallon underground storage tank (UST) was removed from the site in 1994. Samples collected during the closure assessment and follow-up soil boring samples contained elevated benzene concentrations. Four Monitoring Wells, MW-1, MW-3, RW-1 and RW-2, were installed in July 1994 and decommissioned in April and May 2007 by HartCrowser. Remedial actions completed in 2007 included excavating impacted soil, pumping and disposing free-phase hydrocarbons and water emulsion, and placing Oxygen Releasing Compound Advanced (ORC-A) in the excavation.

In an April 12, 2007 letter, the Alaska Department of Environmental Conservation (ADEC) requested a site investigation to evaluate the current concentrations and extent of the petroleum impact.

FIELD ACTIVITIES

The field efforts consisted of advancing one soil boring, installing and developing one monitoring well, and collecting soil and groundwater samples for analysis. Utility locates were requested prior to implementing field activities. The boring location is shown on Figure 1. A photograph of the completed boring and monitoring well is included in Attachment 1. Boring and well completion logs are provided in Attachment 2.

Note that a second boring was considered for the purpose of collecting soil vapor samples, pending a review of analytical sample results from the first boring and monitoring well. Following review of the results by the ADEC, and discussion with Mr. Bill Petrik of the ADEC, it was decided vapor sampling would be postponed until 2009.

Soil Borings and Soil Sampling

On July 11, 2008, Discovery Drilling (Discovery) of Anchorage, Alaska advanced one boring, designated Boring B1, using a truck-mounted CME-75 drill rig with hollow stem augers. Boring B1 was advanced approximately 7 feet east of an exterior wall separating Apparatus Bay 126 and Apparatus Bay 127. The location of the boring/monitoring well is shown on Figure 1. The location is intended to be as close to the former Monitoring Well MW-1 as feasible, while permitting future sampling of the monitoring well without undue effect on fire station operations. The location of former Monitoring Well MW-1 was approximated by comparing drawings of the old firehouse building and the current building.

Soil samples were collected using 3-inch outside diameter split spoon samplers driven by a 340-pound drop hammer. Soil samples were collected continuously until groundwater contact was confirmed. Groundwater was encountered about 11 feet below ground surface (bgs). The boring was advanced to a total depth of 15 feet bgs. Drill cuttings from Boring B1 were contained in a labeled, 55-gallon drum and stored on site pending analytical results.

Analytical and headspace soil samples were collected from the split spoon samplers. Each sample was screened for organic vapors using an ADEC-approved headspace sampling procedure. A Thermo Instruments OVM 580B photoionization detector (PID) was calibrated before screening activities with 100 parts per million (ppm) isobutylene. Headspace samples were collected in re-sealable plastic bags by filling them with freshly exposed soil to approximately one-third capacity and then sealing the top. The samples were warmed to a common temperature and screened within 60 minutes of sample collection.

Two soil samples from the boring were selected for analytical testing. One sample was selected based on location immediately above the apparent groundwater level. A second sample was selected based on headspace screening results. Note that the highest PID reading was from the 12 to 14 foot interval; however, that sample was below the groundwater surface. A duplicate sample was also collected, and a soil trip blank accompanied the samples to and from the laboratory for quality control purposes. Headspace readings, sample collection locations and depths, and soil classifications are summarized in Table 1.

Monitoring Well Installation and Groundwater Sampling

Boring B1 was completed as groundwater Monitoring Well B1MW. The well was constructed of 2-inch diameter schedule 40, polyvinyl chloride (PVC) pipe with threaded connections. The lower 10-foot section of the monitoring well was constructed of a PVC well screen with 0.010-inch slots. The screened portion of the well was placed so that the slots would be within the expected low and high groundwater levels. Well packing materials consisted of silica sand and bentonite chips. The monitoring well was completed with a flush mount protective casing embedded in concrete. A well construction log is provided in Attachment 2.

The monitoring well was developed and sampled on July 16, 2008. The well was developed using a surge block and a decontaminated, submersible pump with dedicated disposable tubing. During well development, water quality parameters, including pH, specific conductance, temperature, downhole dissolved oxygen, and turbidity were measured using Hanna and Hach water quality instruments. During development efforts, the well was purged dry. No attempt was made to develop the well further. Purge water was contained in labeled a 55-gallon drum and stored on-site pending analytical results.

Groundwater primary and duplicate samples were collected from Monitoring Well B1MW after allowing the well to recharge to 80 percent of the pre-development water volume. The samples were collected using a submersible pump. Samples were transferred to laboratory-supplied containers in order of volatility, and then placed into chilled coolers for delivery to the project laboratory. A water trip blank accompanied the samples to and from the laboratory for quality control purposes. Well development and sampling data are provided in Table 2.

LABORATORY ANALYSES

Analytical samples were submitted to SGS Environmental Services (SGS) of Anchorage, Alaska on a standard 10 working day turnaround. Three soil samples, including one duplicate, and two groundwater samples, including one duplicate, were analyzed for gasoline range organics (GRO) by Alaska Method 101 (AK 101); diesel range organics (DRO) by AK102; residual range organics (RRO) by AK 103; and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B. Both groundwater samples and one soil sample (Sample B1S6) were also tested for polynuclear aromatic hydrocarbons (PAH) by EPA Method 8270. The PAH analysis was performed on soil sample B1S6, because the GRO, DRO, and RRO cumulative concentration is greater than 500 mg/kg, per Footnote 1 of Table 2A of the ADEC *Underground Storage Tank Procedures Manual* (November 7, 2002). Analytical soil and groundwater results are summarized in Tables 3 and 4, respectively. The laboratory reports and the ADEC Laboratory Data Review Checklists are provided in Attachment 3.

Soil and water trip blanks were used to evaluate potential cross contamination of volatile constituents. The trip blanks were analyzed for GRO and BTEX.

INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) from this project consisted of one 55-gallon drum of soil drill cuttings, one 55-gallon drum of well development water, disposable sampling equipment, and disposable personal protective equipment (PPE). The disposable sampling equipment and PPE were disposed of as unregulated solid waste.

Based on soil and groundwater analytical results, the drums associated with Boring B1/Well BW-1 were picked up and disposed by Emerald Alaska (Emerald) of Anchorage, Alaska on September 15, 2008.

SUBSURFACE CONDITIONS

Based on our observations of recovered samples, the subsurface soil below the asphalt paving consisted of medium dense, brown, slightly silty, gravelly sand to about 7 feet bgs. From 7 feet bgs to the bottom of the borehole at 15 feet bgs, the soil was a medium dense, brown to gray, silty sand.

Groundwater was encountered during drilling at approximately 11 feet bgs. The static groundwater depth on July 16, 2008 in Monitoring Well B1MW was approximately 10.5 feet bgs.

DISCUSSION OF ANALYTICAL RESULTS

The applicable cleanup levels for soil and groundwater are listed in 18 AAC 75 and are provided with the analytical results in Tables 3 and 4, respectively. The soil cleanup criteria are based on the most stringent ADEC Method 2 levels listed in Tables B1 and B2 for the "under 40-inch (precipitation) zone", and Table C of 18 AAC 75.345 for groundwater.

Soil Samples

Three soil samples, including one duplicate sample, were submitted for GRO, DRO, RRO, and BTEX analyses. GRO was detected at concentrations less than the cleanup level in the duplicate pair Samples B1S5 and B1S8, collected from 8 to 10 feet bgs in Boring B1. GRO was also detected in Sample B1S6 at a concentration of 1,100 milligrams per kilogram (mg/kg) that exceeds the cleanup level of 300 mg/kg. None of the three samples contained detectable concentrations of DRO or RRO.

The cumulative concentration of GRO, DRO, and RRO in Sample B1S6 exceeds the 500 mg/kg threshold; therefore, the sample was analyzed for PAHs. Three PAHs were detected: naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. Concentrations of those analytes do not exceed the ADEC cleanup levels.

Each sample contained measurable concentrations of the BTEX compounds. Benzene concentrations exceed the cleanup level in each of the three samples. Toluene and ethylbenzene concentrations exceed the clean up levels in duplicate sample B1S8, and in sample B1S6. Xylenes concentrations exceed the cleanup level only in sample B1S6.

Groundwater Samples

The two water samples were a duplicate pair designated B1MW for the primary sample, and B2MW for the duplicate sample. Both samples contained reported concentrations of GRO and DRO that exceed the respective cleanup levels. According to the laboratory report, the DRO pattern in both primary and duplicate samples is consistent with a weathered gasoline. Neither sample contained detectable RRO.

Both the primary and duplicate samples contained BTEX concentrations that exceed the cleanup levels.

Both samples were tested for PAHs. The primary sample did not contain detectable PAH compounds. The duplicate sample contained detectable concentrations of acenaphthene, fluorene, phenanthrene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. Concentrations of those analytes do not exceed the respective cleanup levels.

QUALITY ASSURANCE SUMMARY

Data quality for this project was assessed using field quality control samples and internal laboratory procedures. Field quality control samples included one duplicate analytical sample and one trip blank for each matrix (soil and groundwater). The project laboratory implements on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQO). Internal laboratory controls to assess data quality for this project included surrogate spikes, method blanks, matrix spike/matrix spike duplicates (MS/MSD), and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to evaluate accuracy, precision, and bias. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the case narrative of their laboratory reports (see Attachment 3).

Shannon & Wilson reviewed the field data and SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist for each laboratory report, included in Attachment 3.

Accuracy was evaluated using the percent recoveries reported by the laboratories for surrogate samples, MS/MSD samples, and LCS/LCSD samples. The following non-conformances were noted:

- The GRO/BTEX surrogate recovery of 4-bromofluorobenzene for each soil sample exceeds control limits, and were biased high due to hydrocarbon interference. The LCS/LCSD recoveries were within the DQO, suggesting that the results are usable.

Precision was evaluated by calculating relative percent difference (RPD) values for duplicate quality control samples, MS/MSD samples, and LCS/LCSD samples. According to the laboratory report, the MS/MSD and LCS/LCSD sample pair RPDs were within the applicable DQO. The following non-conformances were noted:

- For the MS/MSD sample pair, the RPDs for naphthalene and 1-methylnaphthalene were outside of quality control criteria, and results for those compounds were estimated. This does not affect usability of data for project purposes
- The precision results for the field duplicate soil set Samples B1S5/B1S8 are shown in Table 5. The RPDs for GRO (100 percent), benzene (88 percent), toluene (100 percent), ethylbenzene (71 percent), and xylenes (94 percent) and greater than the ADEC's DQO of 50 percent for soil samples. The magnitude of concentrations are up to two orders of magnitude greater than the ADEC cleanup levels; therefore, potential lack of precision is not expected to impact usability for project purposes.

Field logs and records were checked for completeness, accuracy, and adherence to field procedures established in ADEC's guidance documents. No discrepancies were identified in the field records except that the well was not developed in full compliance with ADEC guidance. We do not believe this non-conformance impacts the data usability for the project purpose.

One soil trip blank and one water trip blank accompanied the sample jars from the laboratory to the site during sampling activities and back again to SGS. GRO and BTEX were not detected in the trip blanks, suggesting that the samples were not cross-contaminated with GRO or BTEX during sample transport or handling.

Based on this quality assurance summary, we find the project data to be complete and useable to support the soil and groundwater sampling activities conducted at the project site.

CONCLUSIONS

One soil boring was advanced and one monitoring well was installed for this project. The results of our soil and groundwater sampling indicate that subsurface soil and groundwater at the tested location are impacted by petroleum hydrocarbons at concentrations greater than the ADEC cleanup levels. In the soil samples, the highest concentrations of target analytes were found from the 8 to 10 feet bgs interval, which is immediately above the groundwater interface.

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 research, sampling, and analyses that we conducted. They should not be construed as definite conclusions regarding the project site's soil and groundwater quality. It is possible that our subsurface tests missed higher

levels of petroleum hydrocarbon constituents, although our intention was to sample areas likely to be impacted. 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 Attachment 4, 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.

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December 12, 2008
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SHANNON & WILSON, INC.

We appreciate the opportunity to be of service. If you have questions or comments concerning this report, please call Matt Hemry, P.E. or the undersigned at (907) 561-2120.

Sincerely,

SHANNON & WILSON, INC.

A handwritten signature in black ink, appearing to read 'Nicholas E. Protos', with a long horizontal flourish extending to the right.

Nicholas E. Protos
Sr. Environmental Engineer

Enc: Tables 1 through 5
Figure 1
Attachments 1 through 4

32-1-17207

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

| Sample ID Number [^] | Date | Sample Location (See Figure 1) | Depth (feet bgs for soil) | Headspace (ppm) [^] | Sample Classification** (See Attachment 2) |
|--------------------------------|-----------|--------------------------------|---------------------------|------------------------------|--|
| Soil Samples | | | | | |
| Boring B1 | | | | | |
| B1S1 | 7/11/2008 | Boring B1, Sample S1 | 0-2 | 0.0 | Medium dense, brown, slightly silty, gravelly SAND; moist |
| B1S2 | 7/11/2008 | Boring B1, Sample S2 | 2-4 | 0.2 | Medium dense, brown, slightly silty, gravelly SAND; moist |
| B1S3 | 7/11/2008 | Boring B1, Sample S3 | 4-6 | 0.0 | Medium dense, brown, slightly silty, gravelly SAND; moist |
| B1S4 | 7/11/2008 | Boring B1, Sample S4 | 6-8 | 0.0 | Medium dense, brown, silty SAND; moist |
| * B1S5 | 7/11/2008 | Boring B1, Sample S5 | 8-10 | 210 | Medium dense, gray, silty fine SAND; moist; hydrocarbon odor |
| * B1S8 | 7/11/2008 | Duplicate of B1S5 | 8-10 | 210 | Medium dense, gray, silty fine SAND; moist; hydrocarbon odor |
| * B1S6 | 7/11/2008 | Boring B1, Sample S6 | 10-12 | 39 | Medium dense, brown, silty fine SAND; moist |
| B1S7 | 7/11/2008 | Boring B1, Sample S7 | 12-14 | 590 | Medium dense, gray, silty fine SAND; wet |
| Groundwater Samples | | | | | |
| Monitoring Well B1MW | | | | | |
| * B1MW | 7/16/2008 | Monitoring Well B1MW | 9.95 (BTOC) | - | Groundwater |
| * B2MW | 7/16/2008 | Duplicate of B1MW | 9.95 (BTOC) | - | Groundwater |
| Quality Control Samples | | | | | |
| * TBS | 7/11/2008 | Soil Trip Blank | - | - | Ottawa sand with methanol added in the laboratory |
| * TB | 7/16/2008 | Water Trip Blank | - | - | Organic-free water blank prepared by the laboratory |

KEY**DESCRIPTION**

- * Sample analyzed by the project laboratory (See Tables 3 and 4, and Attachment 3)
- [^] Field screening instrument was a ThermoInstruments 580B photoionization detector (PID)
- ** Sample classification applies to the portion of the specified sample interval from which the sample was collected
- Measurement not recorded or not applicable
- ppm Parts per million
- BTOC Below top of casing

TABLE 2 - WELL DEVELOPMENT AND SAMPLING LOG**WATER LEVEL MEASUREMENT DATA**

| | |
|---|-----------|
| Well Number | B1MW |
| Date Water Level Measured | 7/16/2008 |
| Time Water Level Measured | 14:23 |
| Measured Depth to Water (Feet Below MP) | 9.95 |

DEVELOPMENT AND SAMPLING DATA

| | |
|--|------------------|
| Well Number | B1MW |
| Date Sampled | 7/16/2008 |
| Time Sampled | 15:55 |
| Measured Depth to Water Prior to Purging (Feet Below MP) | 9.95 |
| Total Depth of Well (Feet Below MP) | 14.46 |
| Water Column in Well (ft) | 4.51 |
| Gallons per Foot | 0.16 |
| Water Column Volume (Gallons) | 0.72 |
| Total Volume Removed (Gallons) | 10 |
| Purging/Development | Submersible Pump |
| Sampling Method | Submersible Pump |
| Diameter of Well Casing | 2-inch |
| Remarks | Purged Dry |

WATER QUALITY DATA

| | |
|----------------------------------|------|
| Well Number | B1MW |
| Temperature (°C) | 9.8 |
| pH (Standard Units) | 6.79 |
| Specific Conductance (µS/cm) | 501 |
| Downhole Dissolved Oxygen (mg/L) | 7.10 |
| Turbidity (NTU) | 50.8 |

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

KEY DESCRIPTION

| | |
|-------|-------------------------------|
| MP | Measuring point |
| °C | Degrees Celsius |
| µS/cm | Microsiemens per centimeter |
| mg/L | Milligrams per liter |
| NTU | Nephelometric Turbidity Units |

TABLE 3 - SUMMARY OF SOIL ANALYTICAL RESULTS

| Parameter Tested | Method* | Cleanup Level** | Sample ID Number^, and Collection Depth in Feet (See Table 1, Figure 1, and Attachment 3*) | | | |
|---|------------|-----------------|---|---------------|---------------|----------|
| | | | Soil Borings | | | QC |
| | | | B1S5 8-10 | B1S8~ 8-10 | B1S6 10-12 | TBS - |
| Headspace Reading - ppm | OVM 580B | - | 210 | 210 | 39 | - |
| Total Solids - percent | SM20 2540G | - | 83.8 | 84.5 | 81.1 | 100 |
| Gasoline Range Organics (GRO) - mg/kg | AK 101 | 300 | 40.9 | 123 | 1,110 | <2.57 |
| Diesel Range Organics (DRO) - mg/kg | AK 102 | 250 | <23.6 | <23.4 | <24.4 | - |
| Residual Range Organics (RRO) - mg/kg | AK 103 | 10,000 | <23.6 | <23.4 | <24.4 | - |
| Aromatic Volatile Organics (BTEX) | | | | | | |
| Benzene - mg/kg | EPA 8021B | 0.025 | 0.680 | 1.75 | 15.1 | <0.0128 |
| Toluene - mg/kg | EPA 8021B | 6.5 | 3.92 | 11.8 | 146 | <0.0513 |
| Ethylbenzene - mg/kg | EPA 8021B | 6.9 | 2.96 | 6.25 | 67.8 | <0.0513 |
| Xylenes - mg/kg | EPA 8021B | 63 | 6.32 | 17.6 | 303 | <0.0513 |
| Polynuclear Aromatic Hydrocarbons (PAH) | | | | | | |
| Naphthalene - mg/kg | EPA 8270D | 20 | - | - | 2.41 | - |
| 1-Methylnaphthalene - mg/kg | EPA 8270D | 6.2 | - | - | 1.48 | - |
| 2-Methylnaphthalene - mg/kg | EPA 8270D | 6.1 | - | - | 2.53 | - |
| Other PAHs | EPA 8270D | - | - | - | ND | - |

KEY**DESCRIPTION**

*

See Attachment 3 for compounds tested, methods, and laboratory reporting limits

**

Soil cleanup level is the most stringent Method 2 standard listed in Table B1 or B2, 18 AAC 75 (October 2008), for the "under 40 inches (precipitation) zone"

^

Sample identification number is preceded by "17207-" on the chain-of-custody form

QC

Quality Control

TBS

Trip Blank - Soil

~

Duplicate of preceding sample, B1S5

1,110

Reported concentration exceeds the regulated cleanup level

ppm

Parts per million

mg/kg

Milligrams per kilogram

<2.57

Analyte not detected; laboratory reporting limit of 2.57

-

Not applicable or sample not tested for this analyte

ND

Not Detected

TABLE 4 - SUMMARY OF WATER ANALYTICAL RESULTS

| Parameter Tested | Method* | Cleanup Level** | Sample ID Number^ and Water Depth in Feet (See Tables 1 and 2, Figure 1, and Attachment 3*) | | |
|---|-----------|-----------------|---|---------------|-----------|
| | | | Monitoring Wells | | QC |
| | | | B1MW 9.95 | B2MW~ 9.95 | TB - |
| Gasoline Range Organics (GRO) - mg/L | AK 101 | 2.2 | 122 | 128 | <0.100 |
| Diesel Range Organics (DRO) - mg/L | AK 102 | 1.5 | 5.75 | 5.68 | - |
| Residual Range Organics (RRO) - mg/L | AK 103 | 1.1 | <0.926 | <0.962 | - |
| Aromatic Volatile Organics (BTEX) | | | | | |
| Benzene - mg/L | EPA 8021B | 0.005 | 21.6 | 23.5 | <0.000500 |
| Toluene - mg/L | EPA 8021B | 1.0 | 29.0 | 33.7 | <0.00200 |
| Ethylbenzene - mg/L | EPA 8021B | 0.7 | 4.74 | 4.97 | <0.00200 |
| Xylenes - mg/L | EPA 8021B | 10.0 | 15.3 | 15.7 | <0.00200 |
| Polynuclear Aromatic Hydrocarbons (PAH) | | | | | |
| Acenaphthene - mg/L | EPA 8270D | 2.2 | <0.0000500 | 0.000129 | - |
| Fluorene - mg/L | EPA 8270D | 1.5 | <0.0000500 | 0.0000827 | - |
| Phenanthrene - mg/L | EPA 8270D | 11.0 | <0.0000500 | 0.0000770 | - |
| Naphthalene - mg/L | EPA 8270D | 0.73 | <0.000100 | 0.274 | - |
| 1-Methylnaphthalene - mg/L | EPA 8270D | 0.15 | <0.0000500 | 0.0321 | - |
| 2-Methylnaphthalene - mg/L | EPA 8270D | 0.15 | <0.0000500 | 0.0437 | - |
| Other PAHs | EPA 8270D | - | ND | ND | - |

KEY **DESCRIPTION**

| | |
|------------|---|
| * | See Attachment 3 for compounds tested, methods, and laboratory reporting limits |
| ** | Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (October 2008) |
| ^ | Sample identification number is preceded by "17207-" on the chain-of-custody form |
| QC | Quality Control |
| TB | Trip Blank |
| ~ | Duplicate of preceding sample, B1MW |
| 122 | Reported concentration exceeds the regulated cleanup level |
| <0.100 | Analyte not detected; laboratory reporting limit of 0.100 |
| - | Not applicable or sample not tested for this analyte |
| mg/L | Milligrams per liter |
| ND | Not Detected |

TABLE 5 - QUALITY CONTROL DATA

SOIL SAMPLES

| Parameter | Primary Sample B1S5 | Duplicate Sample B1S8 | Precision (RPD) | Precision QC Limit |
|---------------------------------------|------------------------|--------------------------|--------------------|-----------------------|
| Total Solids - percent | 83.8 | 84.5 | 1% | 50% |
| Gasoline Range Organics (GRO) - mg/kg | 40.9 | 123 | 100% | 50% |
| Diesel Range Organics (DRO) - mg/kg | ND | ND | - | - |
| Residual Range Organics (RRO) - mg/kg | ND | ND | - | - |
| Aromatic Volatile Organics (BTEX) | | | | |
| Benzene - mg/kg | 0.680 | 1.75 | 88% | 50% |
| Toluene - mg/kg | 3.92 | 11.8 | 100% | 50% |
| Ethylbenzene - mg/kg | 2.96 | 6.25 | 71% | 50% |
| Xylenes - mg/kg | 6.32 | 17.6 | 94% | 50% |

WATER SAMPLES

| Parameter* | Primary Sample B1MW | Duplicate Sample B2MW | Precision (RPD) | Precision QC Limit |
|---------------------------------------|------------------------|--------------------------|--------------------|-----------------------|
| Gasoline Range Organics (GRO) - mg/L | 122 | 128 | 5% | 30% |
| Diesel Range Organics (DRO) - mg/L | 5.75 | 5.68 | 1% | 30% |
| Residual Range Organics (RRO) - mg/kg | ND | ND | - | - |
| Aromatic Volatile Organics (BTEX) | | | | |
| Benzene - mg/L | 21.6 | 23.5 | 8% | 30% |
| Toluene - mg/L | 29.0 | 33.7 | 15% | 30% |
| Ethylbenzene - mg/L | 4.74 | 4.97 | 5% | 30% |
| Xylenes - mg/L | 15.3 | 15.7 | 3% | 30% |

KEY

*

RPD

QC

mg/kg

mg/L

88%

ND

DESCRIPTION

PAHs were analyzed; however, none were detected in the primary sample, and RPDs could not be calculated

Relative Percent Difference

Quality Control

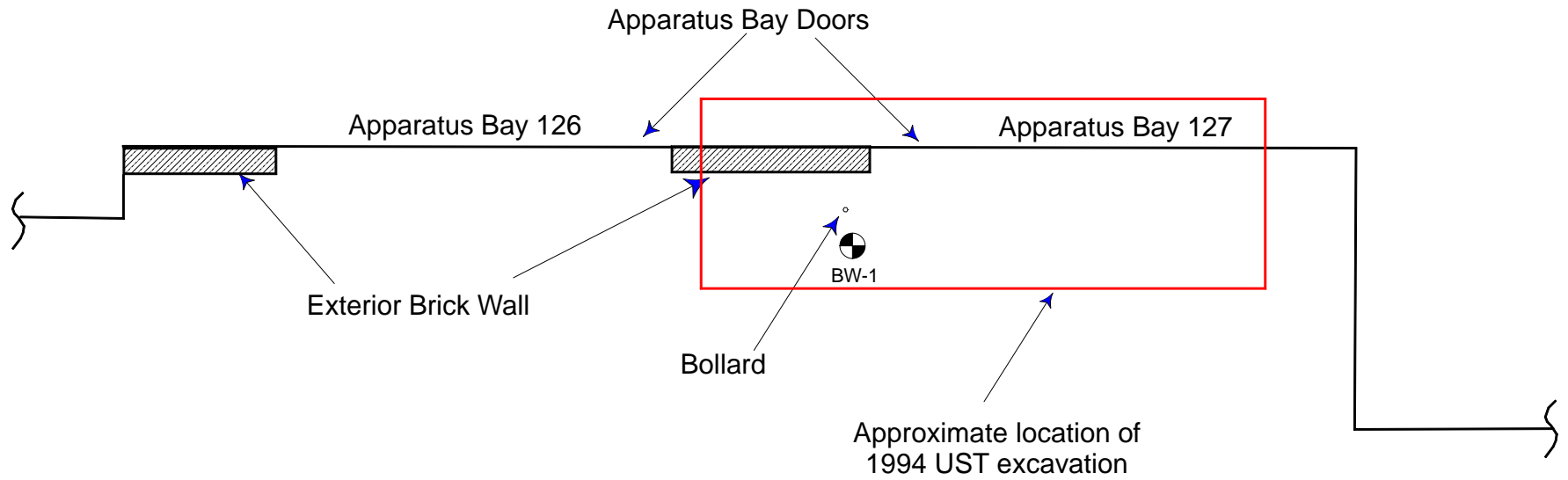
Milligrams per kilogram

Milligrams per liter


Value exceeds QC limit

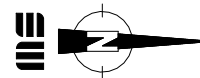
Analyte not detected

ANCHORAGE FIRE STATION NO. 4



LEGEND

 Boring/Monitoring Well installed by Shannon & Wilson on July 11, 2008
BW-1



| | |
|---|---------------|
| 4350 MacInnes Street Anchorage, Alaska | |
| SITE PLAN | |
| December 2008 | 32-1-17207 |
|  SHANNON & WILSON, INC. Geotechnical & Environmental Consultants | Fig. 1 |

ATTACHMENT 1

SITE PHOTOGRAGHS



Photo 1: A view of Monitoring Well B1MW, located on the east side of Fire Station No. 4 after completion of installation; looking northwest (July 2008).

4350 MacInnes Street
Anchorage, Alaska

PHOTO 1

December 2008

32-1-17207



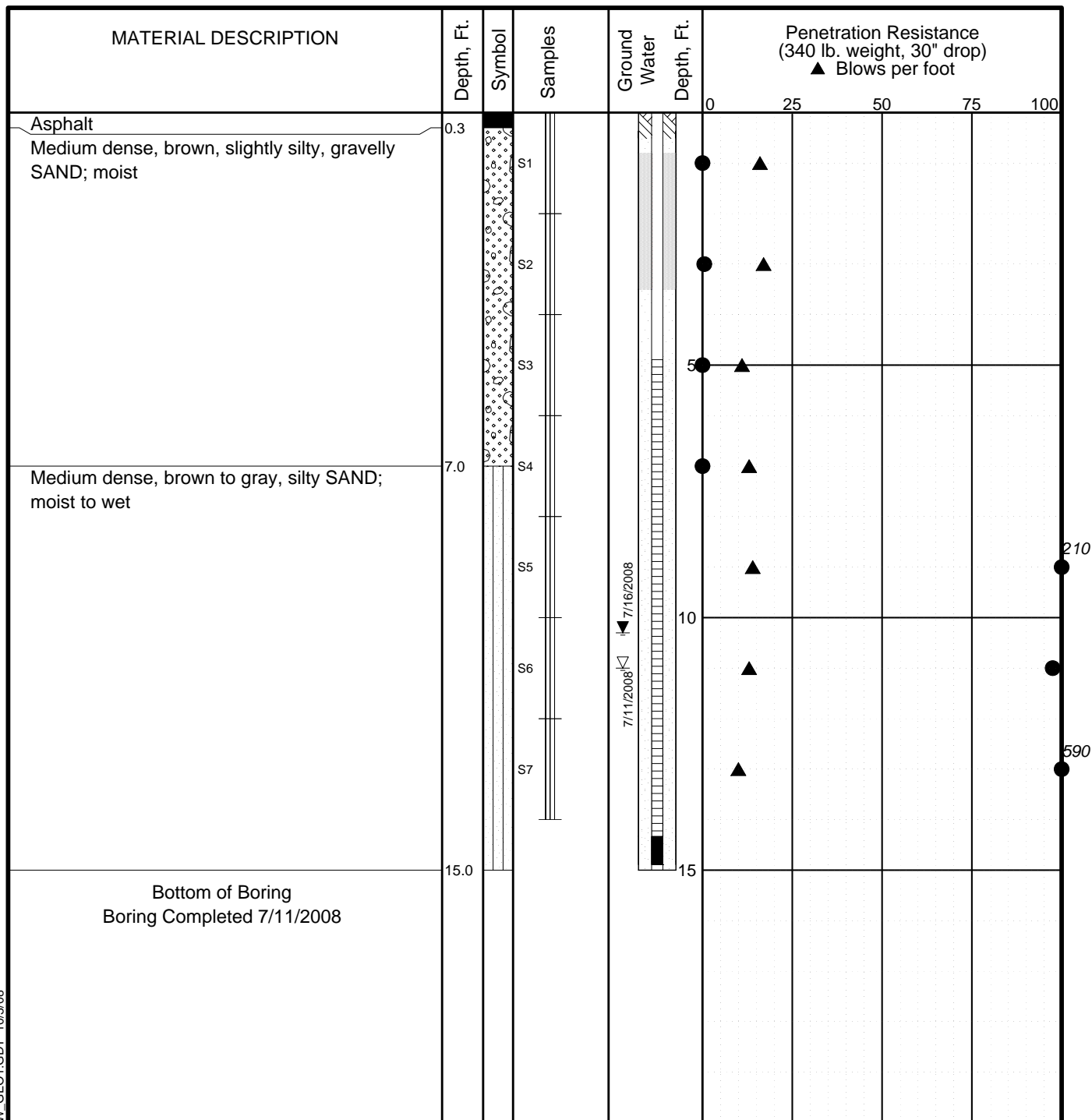
SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

A1-1

ATTACHMENT 2

BORING AND WELL COMPLETION LOGS

ENVIRONMENTAL LOG 17207 BORING AND WELL LOGS.GPJ S&W GEO1.GDT 10/3/08



LEGEND

- | | | | |
|----------------------------|--|--|--|
| * Sample Not Recovered | | Surface Seal | |
| 3" O.D. Split Spoon Sample | | Solid Casing and Annular Seal | |
| Grab Sample | | Well Casing and Filter Sand | |
| | | Cuttings Backfill | |
| | | Ground Water Level At Time Of Drilling | |
| | | Static Water Level | |

● PID Reading (ppm)

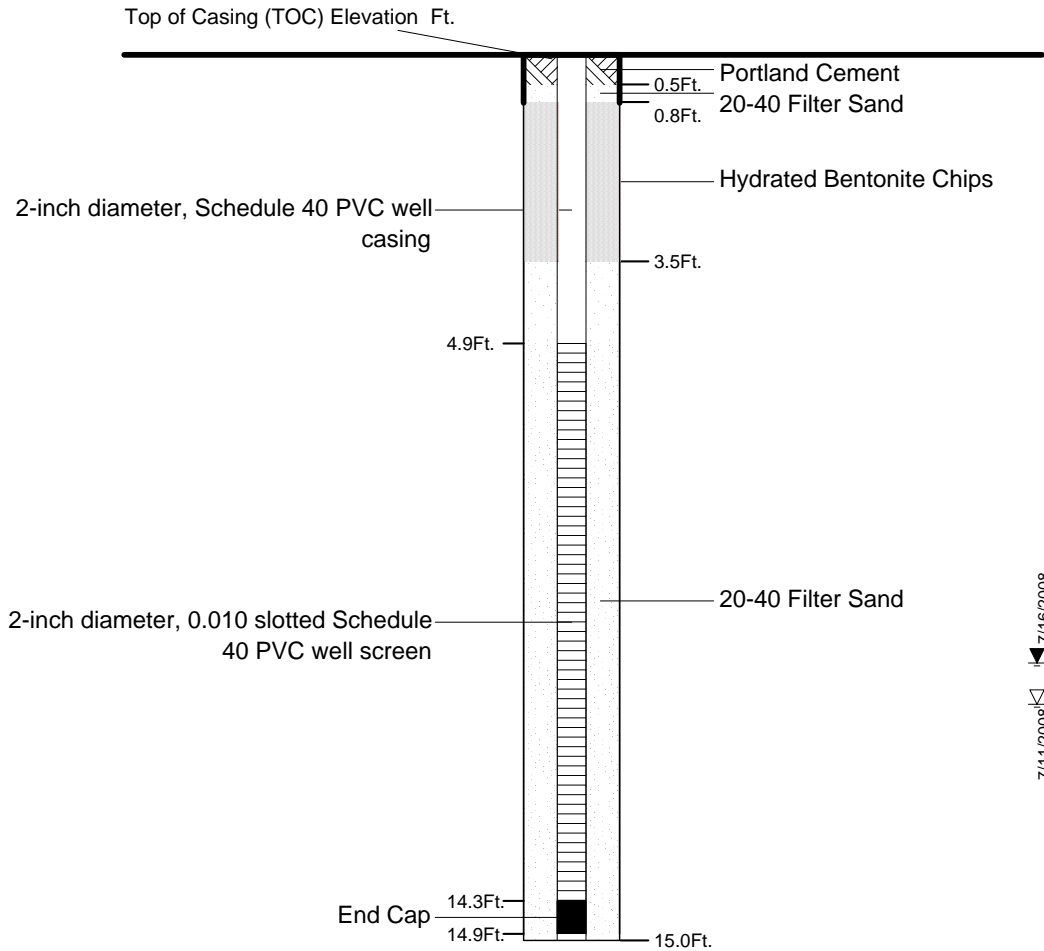
NOTES

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

| | |
|--|-------------|
| 4350 MacInnes Street Anchorage, Alaska | |
| LOG OF BORING B1 | |
| October 2008 | 32-1-17207 |
| SHANNON & WILSON, INC. Geotechnical and Environmental Consultants | A2-1 |

Casing Description


Backfill Description



LEGEND

- ▽ Ground Water Level ATD
- ▼ Static Ground Water Level

NOTE: All joints use threaded connections.

| | |
|---|-------------|
| 4350 MacInnes Street Anchorage, Alaska | |
| MONITORING WELL B1MW CONSTRUCTION DETAIL | |
| October 2008 | 32-1-17207 |
|  SHANNON & WILSON, INC. Geotechnical and Environmental Consultants | A2-2 |

ATTACHMENT 3

**RESULTS OF ANALYTICAL TESTING BY
SGS ENVIRONMENTAL SERVICES OF ANCHORAGE, ALASKA**

AND

ADEC LABORATORY DATA REVIEW CHECKLIST



**SGS Environmental Services
Alaska Division
Level II Laboratory Data Report**

Project: 32-1-17207 4350 MacInnes
Client: Shannon & Wilson Inc.
SGS Work Order: 1083370

Released by:

Contents:

Cover Page
Case Narrative
Final Report Pages
Quality Control Summary Forms
Chain of Custody/Sample Receipt Forms

Note:
Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the standards set forth by the proper regulatory authority, the SGS Quality Assurance Program Plan, and the National Environmental Accreditation Conference.



Case Narrative

Client SHANNOT Shannon & Wilson Inc.
Workorder 1083370 32-1-17207 4350 MacInnes

Printed Date/Time 8/6/2008 9:25

Sample ID **Client Sample ID**

Refer to the sample receipt form for information on sample condition.

1083370001 PS 17207-B1S5
AK101/8021B - BFB (surrogate) recovery does not meet QC goals (biased high) due to hydrocarbon interference.

1083370002 PS 17207-B1S6
AK101/8021B - BFB (surrogate) recovery does not meet QC goals (biased high) due to hydrocarbon interference.
8207D SIMS - MS/MSD RPD is outside of QC criteria for naphthalene and 1-methylnaphthalene. Results for these compounds are estimated.

1083370003 PS 17207-B1S8
AK101/8021B - BFB (surrogate) recovery does not meet QC goals (biased high) due to hydrocarbon interference.

843937 MS 17207-B1S6(1083370002MS)
8207D SIMS - MS/MSD RPD is outside of QC criteria for naphthalene and 1-methylnaphthalene. Results for these compounds are estimated.

843938 MSD 17207-B1S6(1083370002MSD)
8207D SIMS - MS/MSD RPD is outside of QC criteria for naphthalene and 1-methylnaphthalene. Results for these compounds are estimated.



Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: <http://www.us.sgs.com>

Andrew Lee
Shannon & Wilson Inc.
5430 Fairbanks Street
Suite 3
Anchorage, AK 99518

| | | |
|---------------------|--------------------------|---------------------|
| Work Order: | 1083370 | |
| | 32-1-17207 4350 MacInnes | Released by: |
| Client: | Shannon & Wilson Inc. | |
| Report Date: | August 06, 2008 | |

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request.

The laboratory certification numbers are AK971-05 (DW), UST-005 (CS) and AK00971 (Micro) for ADEC and 001992 for NELAP (RCRA methods: 1020A, 1311, 6010B, 7470A, 7471A, 9040B, 9045C, 9056, 9060, 9065, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP, the National Environmental Laboratory Accreditation Program and, when applicable, other regulatory authorities.

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.

The following descriptors may be found on your report which will serve to further qualify the data.

| | |
|-----|--|
| PQL | Practical Quantitation Limit (reporting limit). |
| U | Indicates the analyte was analyzed for but not detected. |
| F | Indicates value that is greater than or equal to the MDL. |
| J | The quantitation is an estimation. |
| ND | Indicates the analyte is not detected. |
| B | Indicates the analyte is found in a blank associated with the sample. |
| * | The analyte has exceeded allowable regulatory or control limits. |
| GT | Greater Than |
| D | The analyte concentration is the result of a dilution. |
| LT | Less Than |
| ! | Surrogate out of control limits. |
| Q | QC parameter out of acceptance range. |
| M | A matrix effect was present. |
| JL | The analyte was positively identified, but the quantitation is a low estimation. |
| E | The analyte result is above the calibrated range. |
| R | Rejected |

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.



SGS Ref.# 1083370001
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Client Sample ID 17207-B1S5
Matrix Soil/Solid (dry weight)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/06/2008 9:25
Collected Date/Time 07/11/2008 14:45
Received Date/Time 07/11/2008 16:35
Technical Director Stephen C. Ede

Sample Remarks:

AK101/8021B - BFB (surrogate) recovery does not meet QC goals (biased high) due to hydrocarbon interference.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|------|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | 40.9 | 5.43 | mg/Kg | AK101 | A | | 07/11/08 | 07/16/08 | HM |
| Benzene | 680 | 27.1 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Toluene | 3920 | 109 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Ethylbenzene | 2960 | 109 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| o-Xylene | 777 | 109 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| P & M -Xylene | 5540 | 109 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| <u>Surrogates</u> | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 171 | ! | % | AK101 | A | 50-150 | 07/11/08 | 07/16/08 | HM |
| 1,4-Difluorobenzene <surr> | 90.4 | | % | SW8021B | A | 80-120 | 07/11/08 | 07/16/08 | HM |
| <u>Semivolatile Organic Fuels Department</u> | | | | | | | | | |
| Diesel Range Organics | ND | 23.6 | mg/Kg | AK102 | B | | 07/15/08 | 07/17/08 | HKG |
| Residual Range Organics | ND | 23.6 | mg/Kg | AK103 | B | | 07/15/08 | 07/17/08 | HKG |
| <u>Surrogates</u> | | | | | | | | | |
| 5a Androstane <surr> | 75.9 | | % | AK102 | B | 50-150 | 07/15/08 | 07/17/08 | HKG |
| n-Triacontane-d62 <surr> | 77.1 | | % | AK103 | B | 50-150 | 07/15/08 | 07/17/08 | HKG |
| <u>Solids</u> | | | | | | | | | |
| Total Solids | 83.8 | | % | SM20 2540G | B | | | 07/17/08 | KDC |



SGS Ref.# 1083370002
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Client Sample ID 17207-B1S6
Matrix Soil/Solid (dry weight)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/06/2008 9:25
Collected Date/Time 07/11/2008 15:02
Received Date/Time 07/11/2008 16:35
Technical Director Stephen C. Ede

Sample Remarks:

AK101/8021B - BFB (surrogate) recovery does not meet QC goals (biased high) due to hydrocarbon interference.
 8207D SIMS - MS/MSD RPD is outside of QC criteria for naphthalene and 1-methylnaphthalene. Results for these compounds are estimated.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|------|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | 1110 | 158 | mg/Kg | AK101 | A | | 07/11/08 | 07/16/08 | HM |
| Benzene | 15100 | 788 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Toluene | 146000 | 3150 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Ethylbenzene | 67800 | 3150 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| o-Xylene | 88700 | 3150 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| P & M -Xylene | 214000 | 3150 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 1210 | ! | % | AK101 | A | 50-150 | 07/11/08 | 07/16/08 | HM |
| 1,4-Difluorobenzene <surr> | 93.9 | | % | SW8021B | A | 80-120 | 07/11/08 | 07/16/08 | HM |
| <u>Semivolatile Organic Fuels Department</u> | | | | | | | | | |
| Diesel Range Organics | ND | 24.4 | mg/Kg | AK102 | B | | 07/15/08 | 07/17/08 | HKG |
| Residual Range Organics | ND | 24.4 | mg/Kg | AK103 | B | | 07/15/08 | 07/17/08 | HKG |
| Surrogates | | | | | | | | | |
| 5a Androstane <surr> | 84.5 | | % | AK102 | B | 50-150 | 07/15/08 | 07/17/08 | HKG |
| n-Triacontane-d62 <surr> | 83.5 | | % | AK103 | B | 50-150 | 07/15/08 | 07/17/08 | HKG |
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | | | |
| Acenaphthylene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Acenaphthene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Fluorene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Phenanthrene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Anthracene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |



SGS Ref.# 1083370002
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Client Sample ID 17207-B1S6
Matrix Soil/Solid (dry weight)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/06/2008 9:25
Collected Date/Time 07/11/2008 15:02
Received Date/Time 07/11/2008 16:35
Technical Director Stephen C. Ede

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|-----|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | | | |
| Fluoranthene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Pyrene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Benzo(a)Anthracene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Chrysene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Benzo[b]Fluoranthene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Benzo[k]fluoranthene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Benzo[a]pyrene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Indeno[1,2,3-c,d] pyrene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Dibenzo[a,h]anthracene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Benzo[g,h,i]perylene | ND | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| Naphthalene | 2410 | 306 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 08/04/08 | JDH |
| 1-Methylnaphthalene | 1480 | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| 2-Methylnaphthalene | 2530 | 122 | ug/Kg | 8270D SIMS | B | | 07/25/08 | 07/31/08 | JDH |
| <u>Surrogates</u> | | | | | | | | | |
| Terphenyl-d14 <surr> | 87.6 | | % | 8270D SIMS | B | 30-125 | 07/25/08 | 07/31/08 | JDH |
| <u>Solids</u> | | | | | | | | | |
| Total Solids | 81.1 | | % | SM20 2540G | B | | | 07/17/08 | KDC |



SGS Ref.# 1083370003
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Client Sample ID 17207-B1S8
Matrix Soil/Solid (dry weight)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/06/2008 9:25
Collected Date/Time 07/11/2008 14:53
Received Date/Time 07/11/2008 16:35
Technical Director Stephen C. Ede

Sample Remarks:

AK101/8021B - BFB (surrogate) recovery does not meet QC goals (biased high) due to hydrocarbon interference.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|------|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | 123 | 31.7 | mg/Kg | AK101 | A | | 07/11/08 | 07/16/08 | HM |
| Benzene | 1750 | 158 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Toluene | 11800 | 633 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Ethylbenzene | 6250 | 633 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| o-Xylene | 2170 | 633 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| P & M -Xylene | 15400 | 633 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| <u>Surrogates</u> | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 290 | ! | % | AK101 | A | 50-150 | 07/11/08 | 07/16/08 | HM |
| 1,4-Difluorobenzene <surr> | 93.1 | | % | SW8021B | A | 80-120 | 07/11/08 | 07/16/08 | HM |
| <u>Semivolatile Organic Fuels Department</u> | | | | | | | | | |
| Diesel Range Organics | ND | 23.4 | mg/Kg | AK102 | B | | 07/15/08 | 07/17/08 | HKG |
| Residual Range Organics | ND | 23.4 | mg/Kg | AK103 | B | | 07/15/08 | 07/17/08 | HKG |
| <u>Surrogates</u> | | | | | | | | | |
| 5a Androstane <surr> | 81.1 | | % | AK102 | B | 50-150 | 07/15/08 | 07/17/08 | HKG |
| n-Triacontane-d62 <surr> | 86.8 | | % | AK103 | B | 50-150 | 07/15/08 | 07/17/08 | HKG |
| <u>Solids</u> | | | | | | | | | |
| Total Solids | 84.5 | | % | SM20 2540G | B | | | 07/17/08 | KDC |



SGS Ref.# 1083370004
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Client Sample ID 17207-TBS
Matrix Soil/Solid (dry weight)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/06/2008 9:25
Collected Date/Time 07/11/2008 14:45
Received Date/Time 07/11/2008 16:35
Technical Director Stephen C. Ede

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|------|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | ND | 2.57 | mg/Kg | AK101 | A | | 07/11/08 | 07/16/08 | HM |
| Benzene | ND | 12.8 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Toluene | ND | 51.3 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| Ethylbenzene | ND | 51.3 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| o-Xylene | ND | 51.3 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| P & M -Xylene | ND | 51.3 | ug/Kg | SW8021B | A | | 07/11/08 | 07/16/08 | HM |
| <u>Surrogates</u> | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 90.5 | | % | AK101 | A | 50-150 | 07/11/08 | 07/16/08 | HM |
| 1,4-Difluorobenzene <surr> | 93.8 | | % | SW8021B | A | 80-120 | 07/11/08 | 07/16/08 | HM |
| <u>Solids</u> | | | | | | | | | |
| Total Solids | 100 | | % | SM20 2540G | A | | | 07/17/08 | KDC |



SGS Ref.# 841514 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch XXX19639
Method SW3550C
Date 07/15/2008

QC results affect the following production samples:
1083370001, 1083370002, 1083370003

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|--|------------------------------|----------------------------|------|-------|------------------|
| Semivolatile Organic Fuels Department | | | | | |
| Diesel Range Organics | ND | 19.9 | 1.99 | mg/Kg | 07/17/08 |
| Diesel Range Organics | ND | 19.9 | 1.99 | mg/Kg | 07/17/08 |
| Surrogates | | | | | |
| 5a Androstane <surr> | 80.9 | 60-120 | | % | 07/17/08 |
| 5a Androstane <surr> | 79.2 | 60-120 | | % | 07/17/08 |
| Batch | XFC8043 | | | | |
| Method | AK102 | | | | |
| Instrument | HP 5890 Series II FID SV D R | | | | |
| Residual Range Organics | 2.88 J | 19.9 | 1.99 | mg/Kg | 07/17/08 |
| Residual Range Organics | 3.21 J | 19.9 | 1.99 | mg/Kg | 07/17/08 |
| Surrogates | | | | | |
| n-Triacontane-d62 <surr> | 84.8 | 60-120 | | % | 07/17/08 |
| n-Triacontane-d62 <surr> | 81.9 | 60-120 | | % | 07/17/08 |
| Batch | XFC8043 | | | | |
| Method | AK103 | | | | |
| Instrument | HP 5890 Series II FID SV D R | | | | |



SGS Ref.# 841988 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch VXX18372
Method SW5035A
Date 07/16/2008

QC results affect the following production samples:
1083370001, 1083370002, 1083370003, 1083370004

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|-------------------------------|-------------------------|-------|-------|---------------|
| <u>Volatile Fuels Department</u> | | | | | |
| Gasoline Range Organics | ND | 2.50 | 0.500 | mg/Kg | 07/16/08 |
| Surrogates | | | | | |
| 4-Bromofluorobenzene <surr> | 110 | 50-150 | | % | 07/16/08 |
| Batch | VFC9055 | | | | |
| Method | AK101 | | | | |
| Instrument | HP 5890 Series II PID+FID VCA | | | | |
| Benzene | ND | 12.5 | 4.00 | ug/Kg | 07/16/08 |
| Toluene | ND | 50.0 | 15.0 | ug/Kg | 07/16/08 |
| Ethylbenzene | ND | 50.0 | 15.0 | ug/Kg | 07/16/08 |
| o-Xylene | ND | 50.0 | 15.0 | ug/Kg | 07/16/08 |
| P & M -Xylene | ND | 50.0 | 15.0 | ug/Kg | 07/16/08 |
| Surrogates | | | | | |
| 1,4-Difluorobenzene <surr> | 94.6 | 80-120 | | % | 07/16/08 |
| Batch | VFC9055 | | | | |
| Method | SW8021B | | | | |
| Instrument | HP 5890 Series II PID+FID VCA | | | | |



SGS Ref.# 842108 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch
Method
Date

QC results affect the following production samples:
1083370001, 1083370002

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|-----------|---------|----------------------------|-----|-------|------------------|
|-----------|---------|----------------------------|-----|-------|------------------|

Solids

| | | | | | |
|--------------|------------|--|--|---|----------|
| Total Solids | 99.9 | | | % | 07/17/08 |
| Batch | SPT7727 | | | | |
| Method | SM20 2540G | | | | |
| Instrument | | | | | |



SGS Ref.# 842110 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch
Method
Date

QC results affect the following production samples:
1083370003, 1083370004

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|-----------|---------|----------------------------|-----|-------|------------------|
|-----------|---------|----------------------------|-----|-------|------------------|

Solids

| | | | | | |
|--------------|------------|--|--|---|----------|
| Total Solids | | | | % | 07/17/08 |
| Batch | SPT7728 | | | | |
| Method | SM20 2540G | | | | |
| Instrument | | | | | |



SGS Ref.# 843935 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch XXX19705
Method SW3550C
Date 07/25/2008

QC results affect the following production samples:
1083370002

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|----------------------|----------------------------|------|-------|------------------|
| <u>Polynuclear Aromatics GC/MS</u> | | | | | |
| Acenaphthylene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Acenaphthene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Fluorene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Phenanthrene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Anthracene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Fluoranthene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Pyrene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Benzo(a)Anthracene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Chrysene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Benzo[b]Fluoranthene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Benzo[k]fluoranthene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Benzo[a]pyrene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Indeno[1,2,3-c,d] pyrene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Dibenzo[a,h]anthracene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Benzo[g,h,i]perylene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Naphthalene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| 1-Methylnaphthalene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| 2-Methylnaphthalene | ND | 5.00 | 1.50 | ug/Kg | 08/01/08 |
| Surrogates | | | | | |
| Terphenyl-d14 <surr> | 103 | 30-125 | | % | 08/01/08 |
| Batch | XMS4640 | | | | |
| Method | 8270D SIMS | | | | |
| Instrument | HP 6890/5973 MS SVOA | | | | |



SGS Ref.# 842109 Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Original 1083356001
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch
Method
Date

QC results affect the following production samples:
1083370001, 1083370002

| Parameter | Original Result | QC Result | Units | RPD | RPD Limits | Analysis Date |
|-----------|-----------------|-----------|-------|-----|------------|---------------|
|-----------|-----------------|-----------|-------|-----|------------|---------------|

Solids

| | | | | | | |
|--------------|------------|------|---|---|--------|------------|
| Total Solids | 79.7 | 79.8 | % | 0 | (< 15) | 07/17/2008 |
| Batch | SPT7727 | | | | | |
| Method | SM20 2540G | | | | | |
| Instrument | | | | | | |



SGS Ref.# 842111 Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Original 1083370003
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch
Method
Date

QC results affect the following production samples:
1083370003, 1083370004

| Parameter | Original Result | QC Result | Units | RPD | RPD Limits | Analysis Date |
|-----------|-----------------|-----------|-------|-----|------------|---------------|
|-----------|-----------------|-----------|-------|-----|------------|---------------|

Solids

| | | | | | | |
|--------------|------------|------|---|---|--------|------------|
| Total Solids | 84.5 | 84.5 | % | 0 | (< 15) | 07/17/2008 |
| Batch | SPT7728 | | | | | |
| Method | SM20 2540G | | | | | |
| Instrument | | | | | | |



SGS Ref.# 841515 Lab Control Sample
841516 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch XXX19639
Method SW3550C
Date 07/15/2008

QC results affect the following production samples:
1083370001, 1083370002, 1083370003

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Semivolatile Organic Fuels Department

| | | | | | | | | |
|-----------------------|------|-----|----|------------|---|---------|-----------|------------|
| Diesel Range Organics | LCS | 148 | 90 | (75-125) | | | 164 mg/Kg | 07/17/2008 |
| | LCSD | 154 | 94 | | 4 | (< 20) | 164 mg/Kg | 07/17/2008 |

Surrogates

| | | | | | | | | |
|----------------------|------|--|----|------------|---|--|--|------------|
| 5a Androstane <surr> | LCS | | 89 | (60-120) | | | | 07/17/2008 |
| | LCSD | | 94 | | 6 | | | 07/17/2008 |

Batch XFC8043
Method AK102
Instrument HP 5890 Series II FID SV D R

| | | | | | | | | |
|-------------------------|------|-----|----|------------|---|---------|-----------|------------|
| Residual Range Organics | LCS | 145 | 88 | (60-120) | | | 164 mg/Kg | 07/17/2008 |
| | LCSD | 147 | 90 | | 2 | (< 20) | 164 mg/Kg | 07/17/2008 |

Surrogates

| | | | | | | | | |
|--------------------------|------|--|----|------------|---|--|--|------------|
| n-Triacontane-d62 <surr> | LCS | | 83 | (60-120) | | | | 07/17/2008 |
| | LCSD | | 86 | | 4 | | | 07/17/2008 |

Batch XFC8043
Method AK103
Instrument HP 5890 Series II FID SV D R



SGS Ref.# 841989 Lab Control Sample
841990 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch VXX18372
Method SW5035A
Date 07/16/2008

QC results affect the following production samples:

1083370001, 1083370002, 1083370003, 1083370004

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|------------|-----------|-----------------|-----|------------|---------------|---------------|
| <u>Volatile Fuels Department</u> | | | | | | | |
| Benzene | LCS 1290 | 103 | (80-125) | | | 1250 ug/Kg | 07/16/2008 |
| | LCSD 1290 | 103 | | 0 | (< 20) | 1250 ug/Kg | 07/16/2008 |
| Toluene | LCS 1260 | 101 | (85-120) | | | 1250 ug/Kg | 07/16/2008 |
| | LCSD 1270 | 101 | | 1 | (< 20) | 1250 ug/Kg | 07/16/2008 |
| Ethylbenzene | LCS 1280 | 102 | (85-125) | | | 1250 ug/Kg | 07/16/2008 |
| | LCSD 1290 | 103 | | 1 | (< 20) | 1250 ug/Kg | 07/16/2008 |
| o-Xylene | LCS 1250 | 100 | (85-125) | | | 1250 ug/Kg | 07/16/2008 |
| | LCSD 1270 | 102 | | 2 | (< 20) | 1250 ug/Kg | 07/16/2008 |
| P & M -Xylene | LCS 2570 | 103 | (85-125) | | | 2500 ug/Kg | 07/16/2008 |
| | LCSD 2600 | 104 | | 1 | (< 20) | 2500 ug/Kg | 07/16/2008 |
| Surrogates | | | | | | | |
| 1,4-Difluorobenzene <surr> | LCS | 99 | (80-120) | | | | 07/16/2008 |
| | LCSD | | | | | | |

Batch VFC9055
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 841991 Lab Control Sample
841992 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep Batch VXX18372
Method SW5035A
Date 07/16/2008

QC results affect the following production samples:

1083370001, 1083370002, 1083370003, 1083370004

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Volatile Fuels Department

| | | | | | | | |
|-------------------------|------|------|-----|------------|---|------------|-----------------------|
| Gasoline Range Organics | LCS | 11.3 | 100 | (60-120) | | 11.3 mg/Kg | 07/16/2008 |
| | LCSD | 10.8 | 96 | | 5 | (< 20) | 11.3 mg/Kg 07/16/2008 |

Surrogates

| | | | | | | | |
|-----------------------------|------|--|-----|------------|---|--|------------|
| 4-Bromofluorobenzene <surr> | LCS | | 108 | (50-150) | | | 07/16/2008 |
| | LCSD | | 107 | | 1 | | 07/16/2008 |

Batch VFC9055
Method AK101
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 843936 Lab Control Sample

Printed Date/Time 08/06/2008 9:25
Prep Batch XXX19705
Method SW3550C
Date 07/25/2008

Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

QC results affect the following production samples:

1083370002

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Polynuclear Aromatics GC/MS



SGS Ref.# 843936 Lab Control Sample
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Printed Date/Time 08/06/2008 9:25
Prep **Batch** XXX19705
Method SW3550C
Date 07/25/2008

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|------------|-----------|-----------------|-----|------------|---------------|---------------|
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | |
| Acenaphthylene | LCS 15.2 | 69 | (45-102) | | | 21.9 ug/Kg | 07/31/2008 |
| Acenaphthene | LCS 14.9 | 68 | (45-99) | | | 21.9 ug/Kg | 07/31/2008 |
| Fluorene | LCS 15.6 | 71 | (50-107) | | | 21.9 ug/Kg | 07/31/2008 |
| Phenanthrene | LCS 16.6 | 76 | (50-110) | | | 21.9 ug/Kg | 07/31/2008 |
| Anthracene | LCS 15.4 | 70 | (28-103) | | | 21.9 ug/Kg | 07/31/2008 |
| Fluoranthene | LCS 17.3 | 79 | (55-115) | | | 21.9 ug/Kg | 07/31/2008 |
| Pyrene | LCS 16.6 | 76 | (45-120) | | | 21.9 ug/Kg | 07/31/2008 |
| Benzo(a)Anthracene | LCS 17.9 | 81 | (40-110) | | | 21.9 ug/Kg | 07/31/2008 |
| Chrysene | LCS 16.1 | 73 | (55-110) | | | 21.9 ug/Kg | 07/31/2008 |
| Benzo[b]Fluoranthene | LCS 18.3 | 83 | (45-115) | | | 21.9 ug/Kg | 07/31/2008 |
| Benzo[k]fluoranthene | LCS 17.8 | 81 | (45-120) | | | 21.9 ug/Kg | 07/31/2008 |
| Benzo[a]pyrene | LCS 14.8 | 68 | (10-102) | | | 21.9 ug/Kg | 07/31/2008 |
| Indeno[1,2,3-c,d] pyrene | LCS 17.1 | 78 | (40-120) | | | 21.9 ug/Kg | 07/31/2008 |
| Dibenzo[a,h]anthracene | LCS 17.1 | 78 | (40-125) | | | 21.9 ug/Kg | 07/31/2008 |
| Benzo[g,h,i]perylene | LCS 17.1 | 78 | (40-118) | | | 21.9 ug/Kg | 07/31/2008 |
| Naphthalene | LCS 14.6 | 66 | (40-92) | | | 21.9 ug/Kg | 07/31/2008 |
| 1-Methylnaphthalene | LCS 14.3 | 65 | (30-97) | | | 21.9 ug/Kg | 07/31/2008 |
| 2-Methylnaphthalene | LCS 14.4 | 66 | (45-96) | | | 21.9 ug/Kg | 07/31/2008 |
| Surrogates | | | | | | | |
| Terphenyl-d14 <surr> | LCS | 97 | (30-125) | | | | 07/31/2008 |



SGS Ref.# 843936 Lab Control Sample

Printed Date/Time 08/06/2008 9:25

Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes
Matrix Soil/Solid (dry weight)

Prep Batch XXX19705
Method SW3550C
Date 07/25/2008

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Polynuclear Aromatics GC/MS

Batch XMS4639
Method 8270D SIMS
Instrument HP 6890/5973 MS SVOA



SGS Ref.# 843937 Matrix Spike
843938 Matrix Spike Duplicate

Printed Date/Time 08/06/2008 9:25
Prep Batch XXX19705
Method Sonication Extraction Soil 8270
Date 07/25/2008

Original 1083462009
Matrix Soil/Solid (dry weight)

QC results affect the following production samples:
1083370002

| Parameter | Qualifiers | Original Result | QC Result | Pet Recov | MS/MSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|------------------------------------|------------|-----------------|-----------|-----------|---------------|------|------------|---------------|---------------|
| Polynuclear Aromatics GC/MS | | | | | | | | | |
| Acenaphthylene | MS | ND | 13.5 | 60 | (45-102) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 17.6 | 77 | | 26 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Acenaphthene | MS | ND | 12.7 | 56 | (45-99) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 16.7 | 73 | | 28 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Fluorene | MS | ND | 13.7 | 61 | (50-107) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 17.6 | 76 | | 24 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Phenanthrene | MS | ND | 18.5 | 81 | (50-110) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 21.4 | 93 | | 15 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Anthracene | MS | ND | 14.7 | 64 | (28-103) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 18.5 | 81 | | 23 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Fluoranthene | MS | ND | 15.5 | 68 | (55-115) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 20.9 | 91 | | 30 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Pyrene | MS | ND | 15.5 | 68 | (45-120) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 20.4 | 89 | | 27 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Benzo(a)Anthracene | MS | ND | 17.0 | 75 | (40-110) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 22.8 | 100 | | 29 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Chrysene | MS | ND | 15.7 | 69 | (55-110) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 19.9 | 87 | | 24 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Benzo[b]Fluoranthene | MS | ND | 19.4 | 85 | (45-115) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 24.6 | 107 | | 24 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Benzo[k]fluoranthene | MS | ND | 15.4 | 68 | (45-120) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 19.3 | 84 | | 23 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Benzo[a]pyrene | MS | ND | 17.3 | 76 | (10-102) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 22.8 | 99 | | 28 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Indeno[1,2,3-c,d] pyrene | MS | ND | 15.8 | 70 | (40-120) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 20.4 | 89 | | 25 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Dibenzo[a,h]anthracene | MS | ND | 15.7 | 69 | (40-125) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 20.0 | 87 | | 24 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Benzo[g,h,i]perylene | MS | ND | 16.4 | 72 | (40-118) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 21.3 | 93 | | 26 | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| Naphthalene | MS | ND | 11.3 | 49 | (40-92) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 15.8 | 69 | | 34 * | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| 1-Methylnaphthalene | MS | ND | 12.3 | 54 | (30-97) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 16.7 | 73 | | 31 * | (< 30) | 22.9 ug/Kg | 08/01/2008 |
| 2-Methylnaphthalene | MS | ND | 13.1 | 58 | (45-96) | | | 22.7 ug/Kg | 08/01/2008 |
| | MSD | | 16.8 | 74 | | 25 | (< 30) | 22.9 ug/Kg | 08/01/2008 |

Surrogates



SGS Ref.# 843937 Matrix Spike
843938 Matrix Spike Duplicate

Printed Date/Time 08/06/2008 9:25
Prep Batch XXX19705
Method Sonication Extraction Soil 8270
Date 07/25/2008

Original 1083462009
Matrix Soil/Solid (dry weight)

| Parameter | Qualifiers | Original Result | QC Result | Pct Recov | MS/MSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------------|-----------|-----------|---------------|-----|------------|---------------|---------------|
|-----------|------------|-----------------|-----------|-----------|---------------|-----|------------|---------------|---------------|

Polynuclear Aromatics GC/MS

| | | | | | | | | | |
|---------------------|-----|------|-----|------------|--|----|--|--|------------|
| Terphenyl-d14 <sur> | MS | 17.7 | 78 | (30-125) | | | | | 08/01/2008 |
| | MSD | 22.8 | 100 | | | 26 | | | 08/01/2008 |

Batch XMS4640
Method 8270D SIMS
Instrument HP 6890/5973 MS SVOA



SGS Environmental Services Inc.

200 W. Potter Drive, Anchorage, AK 99518

phone (907) 562-2343, fax (907) 561-5301

Change Order / Work Amendment

Client: S:W
 Client PM: Andrew
 PH/Fax No. 561.2120

Date / Time: Mon 7/21/08
 Initiated By: ban
 SGS PM: ban

Project: 4350 MacInnes

SGS Ref#: 1083370-

Action To Be Taken: Add Analyses Delete Analyses Add Rush
 Other: _____

| Client ID | SGS # | Specific Requirements | Test Code | Add'l \$ |
|-------------------------|--------|-----------------------|-----------|----------|
| 17207-B156 | 3370-2 | please add 8270 PATT. | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Total Additional Costs: | | | | |

Comments / Details: _____

Authorization: To assure that the correct action is taken, this form will be faxed to the client. The client will review, sign and fax back to SGS Project Manager (Fax 907-561-5301) their authorization of this change in work/cost before the Change Order can be executed.

Client Approval: verbal & email, Date: 7.21.08

Hager, Barbara (Anchorage)

From: Andrew Lee [asl@shawnwil.com]
Sent: Monday, July 21, 2008 10:13 AM
To: Hager, Barbara (Anchorage)
Subject: Re: 1083370 (32-1-17207 4350 McClanes)

Barbara,

Sorry, I got that backwards. Please log sample 2 for PAH, not 1 and 3.

By the way, the site is McInnes, not McClanes.

Thank you,

Andrew

Andrew Lee
Environmental Scientist

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518

Phone (907) 561-2120
Fax (907) 561-4483

www.shannonwilson.com

Excellence, Innovation, Service, and Value Since 1954

>>> "Hager, Barbara (Anchorage)" <Barbara.Hager@sgs.com> 7/21/2008 9:47
>>> AM >>>

Andrew

Please see the attached PDF.

Since samples 1 and 3 had a GRO, DRO/RRO of less than 500 I am having them logged in for 8270 PAH.

Thanks

Barbara

Barbara A. Hager

SGS Environmental Services Inc.

Alaska Division Project Manager

200 West Potter Drive

Anchorage, Alaska 99518

Phone: (907) 562-2343

Direct: (907) 550-3211

Fax: (907) 561-5301

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1083370



SHANNON & WILSON, INC.

Geotechnical and Environmental Consultants
 400 N. 34th Street, Suite 100 Seattle, WA 98103 (206) 632-8020
 2355 Hill Road Fairbanks, AK 99709 (907) 479-0600
 1200 17th Street, Suite 1024 Portland, OR 97201-2498 (503) 223-6147
 303 Wellisian Way Richland, WA 99352 (509) 946-6309
 5430 Fairbanks Street, Suite 3 Anchorage, AK 99518 (907) 561-2120
 Denver, Co 80202 (303) 825-3800

LABORATORY BODY RECORD

Laboratory SGS Page 1 of 1
 Attn: Barbara Hughes

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

| | | | | | | | |
|------|-------------|---------|------------|--------------|------|----------------------------|----------------|
| GRAB | ANAL. CONTS | PRO/REQ | TRAIL BLKS | TRAIL (HOLD) | STZS | Total Number of Containers | Remarks/Matrix |
|------|-------------|---------|------------|--------------|------|----------------------------|----------------|

| Sample Identity | Lab No. | Time | Date Sampled | Comp. | GRAB | ANAL. CONTS | PRO/REQ | TRAIL BLKS | TRAIL (HOLD) | STZS | Total Number of Containers | Remarks/Matrix |
|-----------------|---------|-------|--------------|-------|------|-------------|---------|------------|--------------|------|----------------------------|-----------------|
| 17207-BISS | ① A, B | 1445 | 7/11/08 | X | X | X | X | (X) | | | | Soil |
| " | ② ↓ | 15:02 | 7/11/08 | X | X | X | X | (X) | | | | ↓ |
| " | ③ ↓ | 14:53 | 7/11/08 | X | X | X | X | (X) | | | | Soil trip blank |
| " | ④ A | — | — | | | | | | | | | |

Project Information

Project Number: 32-1-17207
 Project Name: 4350 Machines
 Contact: Andrew Lee & Nitroblasts
 Ongoing Project? Yes No
 Sampler: Andrew Lee

Sample Receipt

Total Number of Containers
 COC Seals/Intact? Y/N/NA
 Received Good Cond./Cold
 Delivery Method:
 (attach shipping bill, if any)

Instructions

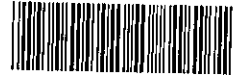
Requested Turnaround Time: Standard
 Special Instructions: Level II & Mole PATH 1
Analyse for PAH only after GAO/PRO/RR0 analysis,
if sum of GAO/PRO/RR0 is less than 500mg/kg.
 Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
 Yellow - w/shipment - for consignee files
 Pink - Shannon & Wilson - Job File

| | | |
|--|---|--|
| Relinquished By: 1. Signature: <u>Andrew Lee</u> Printed Name: <u>Andrew Lee</u> Company: <u>Shannon & Wilson</u> Time: <u>1635</u> Date: <u>7/11/08</u> | Relinquished By: 2. Signature: _____ Printed Name: _____ Company: _____ Time: _____ Date: _____ | Relinquished By: 3. Signature: _____ Printed Name: _____ Company: _____ Time: _____ Date: _____ |
| Received By: 1. Signature: _____ Printed Name: _____ Company: _____ Time: _____ Date: _____ | Received By: 2. Signature: _____ Printed Name: _____ Company: _____ Time: _____ Date: _____ | Received By: 3. Signature: <u>[Signature]</u> Printed Name: <u>Joe Ruchi</u> Company: <u>SGS</u> Time: <u>1635</u> Date: <u>7/11/08</u> <u>700 TRB = 5.8</u> <u>CS 9.9</u> |

FB 49 CS-1-6 052

No. 28968

F-19-91/UR



SAMPLE RECEIPT FORM

SGS WO#:

Yes No NA

- Are samples RUSH, priority or w/in 72 hrs of hold time?
- If yes, have you done e-mail ALERT notification?
- Are samples within 24 hrs. of hold time or due date?
- If yes, have you also spoken with supervisor?
- Archiving bottles (if req'd): Are they properly marked?
- Are there any problems? PM Notified? _____
- Were samples preserved correctly and pH verified? _____

- If this is for PWS, provide PWSID. _____
- Will courier charges apply? _____
- Method of payment? _____
- Data package required? (Level: 1 / (2) / 3 / 4) _____
- Notes: _____
- Is this a DoD project? (USACE, Navy, AFCEE) _____

TAT (circle one): Standard -or- Rush

Received Date: 7/11/08

Received Time: 1635

Is date/time conversion necessary? NO

of hours to AK Local Time: _____

Thermometer ID: 700

| Cooler ID | Temp Blank | Cooler Temp |
|-----------|---------------|---------------|
| <u>1</u> | <u>5.8</u> °C | <u>9.9</u> °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |

Note: Temperature readings include thermometer correction factors

Delivery method (circle all that apply): Client

- Alert Courier / UPS / FedEx / USPS / DHL /
- AA Goldstreak / NAC / ERA / PenAir / Carlisle /
- Lynden / SGS / Other: _____

Airbill # _____

Additional Sample Remarks: (✓if applicable)

- Extra Sample Volume? _____
- Limited Sample Volume? _____
- MeOH field preserved for volatiles?
- Field-filtered for dissolved _____
- Lab-filtered for dissolved _____
- Ref Lab required? _____
- Foreign Soil? _____

This section must be filled out for DoD projects (USACE, Navy, AFCEE)

Yes No

- Is received temperature $4 \pm 2^\circ\text{C}$? _____
- Exceptions: _____ Samples/Analyses Affected: _____
- If temperature(s) $< 0^\circ\text{C}$, were containers ice-free? N/A
Notify PM immediately of any ice in samples.
- Was there an airbill? (Note # above in the right hand column) _____
- Was cooler sealed with custody seals? _____
/ where: _____
- Were seal(s) intact upon arrival? _____
- Was there a COC with cooler? _____
- Was COC sealed in plastic bag & taped inside lid of cooler? _____
- Was the COC filled out properly? _____
- Did the COC indicate USACE / Navy / AFCEE project? _____
- Did the COC and samples correspond? _____
- Were all sample packed to prevent breakage? _____
Packing material: _____
- Were all samples unbroken and clearly labeled? _____
- Were all samples sealed in separate plastic bags? _____
- Were all VOCs free of headspace and/or MeOH preserved? _____
- Were correct container / sample sizes submitted? _____
- Is sample condition good? _____
- Was copy of CoC, SRF, and custody seals given to PM to fax? _____

This section must be filled if problems are found.

Yes No

Was client notified of problems? _____

Individual contacted: _____

Via: Phone / Fax / Email (circle one)

Date/Time: _____

Reason for contact: _____

Change Order Required? _____

SGS Contact: _____

Notes: _____

Completed by (sign): [Signature]

(print): Joe Rul

Login proof (check one): waived required performed by: _____

Laboratory Data Review Checklist

Completed by:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

ADEC RecKey Number:

1. Laboratory

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

Yes No

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

Comments:

2. Chain of Custody (COC)

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

Yes No

Comments:

b. Correct analyses requested?

Yes No

Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?

Yes No

Comments:

Cooler temp was 9.9 °C. Temp blank was acceptable at 5.8 °C

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

Yes No

Comments:

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

Yes No

Comments:

NA

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

Yes No

Comments:

e. Data quality or usability affected? Explain.

Comments:

Temperature of temp blank was acceptable; therefore sample temperatures were likely within range and acceptable

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

c. Were all corrective actions documented?

Yes No

Comments:

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

Comments:

5. Samples Results

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

Yes No

Comments:

b. All applicable holding times met?

Yes No

Comments:

c. All soils reported on a dry weight basis?

Yes No

Comments:

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

Yes No

Comments:

e. Data quality or usability affected? Explain.

Comments:

6. QC Samples

a. Method Blank

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

Yes No Comments:

ii. All method blank results less than PQL?

Yes No Comments:

iii. If above PQL, what samples are affected?

Comments:

NA

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

Yes No Comments:

NA

v. Data quality or usability affected? Explain.

Comments:

NO

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples?

Yes No Comments:

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

Yes No Comments:

NA

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 Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No Comments:

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

Comments:

NA

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

Yes No Comments:

NA

vii. Data quality or usability affected? Explain.

Comments:

NO

c. Surrogates – Organics Only

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

Yes No 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 Comments:

BFB recovery was biased high due to hydrocarbon interference

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

Yes No Comments:

iv. Data quality or usability affected? Explain.

Comments:

NO. Concentrations of analytes were substantially higher than cleanup levels, such that a high bias would not likely be responsible.

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?

Yes No

Comments:

ii. All results less than PQL?

Yes No

Comments:

iii. If above PQL, what samples are affected?

Comments:

NA

iv. Data quality or usability affected? Explain.

Comments:

NO

e. Field Duplicate

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

Yes No

Comments:

ii. Submitted blind to lab?

Yes No

Comments:

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No Comments:

RPDs for the compounds analyzed exceeded the DQO. RPDs ranged from 71% to 100%

iv. Data quality or usability affected? Explain.

Comments:

No. The results were acceptable for the purposes of this project.

f. Decontamination or Equipment Blank (if applicable)

Yes No Not Applicable

i. All results less than PQL?

Yes No Comments:

ii. If above PQL, what samples are affected?

Comments:

NA

iii. Data quality or usability affected? Explain.

Comments:

NA

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

a. Defined and appropriate?

Yes No Comments:



**SGS Environmental Services
Alaska Division
Level II Laboratory Data Report**

Project: 32-1-17207 4350 MacInnes St.
Client: Shannon & Wilson Inc.
SGS Work Order: 1083485

Released by:

Contents:

Cover Page
Case Narrative
Final Report Pages
Quality Control Summary Forms
Chain of Custody/Sample Receipt Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the standards set forth by the proper regulatory authority, the SGS Quality Assurance Program Plan, and the National Environmental Accreditation Conference.



Case Narrative

Client SHANNOT Shannon & Wilson Inc.
Workorder 1083485 32-1-17207 4350 MacInnes St.

Printed Date/Time 8/1/2008 11:41

Sample ID **Client Sample ID**

Refer to the sample receipt form for information on sample condition.

1083485001 PS 17207-B1MW
AK102 - The pattern is consistent with a weathered gasoline.

1083485002 PS 17207-B2MW
AK102 - The pattern is consistent with a weathered gasoline.



Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: <http://www.us.sgs.com>

Andrew Lee
Shannon & Wilson Inc.
5430 Fairbanks Street
Suite 3
Anchorage, AK 99518

| | | |
|---------------------|------------------------------|---------------------|
| Work Order: | 1083485 | |
| | 32-1-17207 4350 MacInnes St. | Released by: |
| Client: | Shannon & Wilson Inc. | |
| Report Date: | August 01, 2008 | |

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request.

The laboratory certification numbers are AK971-05 (DW), UST-005 (CS) and AK00971 (Micro) for ADEC and 001992 for NELAP (RCRA methods: 1020A, 1311, 6010B, 7470A, 7471A, 9040B, 9045C, 9056, 9060, 9065, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP, the National Environmental Laboratory Accreditation Program and, when applicable, other regulatory authorities.

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.

The following descriptors may be found on your report which will serve to further qualify the data.

| | |
|-----|--|
| PQL | Practical Quantitation Limit (reporting limit). |
| U | Indicates the analyte was analyzed for but not detected. |
| F | Indicates value that is greater than or equal to the MDL. |
| J | The quantitation is an estimation. |
| ND | Indicates the analyte is not detected. |
| B | Indicates the analyte is found in a blank associated with the sample. |
| * | The analyte has exceeded allowable regulatory or control limits. |
| GT | Greater Than |
| D | The analyte concentration is the result of a dilution. |
| LT | Less Than |
| ! | Surrogate out of control limits. |
| Q | QC parameter out of acceptance range. |
| M | A matrix effect was present. |
| JL | The analyte was positively identified, but the quantitation is a low estimation. |
| E | The analyte result is above the calibrated range. |
| R | Rejected |

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.



SGS Ref.# 1083485001
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Client Sample ID 17207-B1MW
Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/01/2008 11:41
Collected Date/Time 07/16/2008 15:55
Received Date/Time 07/17/2008 9:18
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered gasoline.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|--------|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | 122 | 10.0 | mg/L | AK101 | A | | 07/28/08 | 07/28/08 | HM |
| Benzene | 21600 | 50.0 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| Toluene | 29000 | 1000 | ug/L | SW8021B | A | | 07/29/08 | 07/29/08 | HM |
| Ethylbenzene | 4740 | 200 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| o-Xylene | 2740 | 200 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| P & M -Xylene | 12600 | 200 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| <u>Surrogates</u> | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 125 | | % | AK101 | A | 50-150 | 07/28/08 | 07/28/08 | HM |
| 1,4-Difluorobenzene <surr> | 96.1 | | % | SW8021B | A | 80-120 | 07/28/08 | 07/28/08 | HM |
| <u>Semivolatile Organic Fuels Department</u> | | | | | | | | | |
| Diesel Range Organics | 5.75 | 0.370 | mg/L | AK102 | D | | 07/25/08 | 07/27/08 | HKG |
| Residual Range Organics | ND | 0.926 | mg/L | AK103 | D | | 07/25/08 | 07/27/08 | HKG |
| <u>Surrogates</u> | | | | | | | | | |
| 5a Androstane <surr> | 83.1 | | % | AK102 | D | 50-150 | 07/25/08 | 07/27/08 | HKG |
| n-Triacontane-d62 <surr> | 84.5 | | % | AK103 | D | 50-150 | 07/25/08 | 07/27/08 | HKG |
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | | | |
| Acenaphthylene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Acenaphthene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Fluorene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Phenanthrene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Anthracene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Fluoranthene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |



SGS Ref.# 1083485001
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Client Sample ID 17207-B1MW
Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/01/2008 11:41
Collected Date/Time 07/16/2008 15:55
Received Date/Time 07/17/2008 9:18
Technical Director Stephen C. Ede

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|------------------------------------|---------|--------|-------|------------|--------------|------------------|-----------|---------------|------|
| Polynuclear Aromatics GC/MS | | | | | | | | | |
| Pyrene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo(a)Anthracene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Chrysene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[b]Fluoranthene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[k]fluoranthene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[a]pyrene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Indeno[1,2,3-c,d] pyrene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Dibenzo[a,h]anthracene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[g,h,i]perylene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Naphthalene | ND | 0.100 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| 1-Methylnaphthalene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| 2-Methylnaphthalene | ND | 0.0500 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Surrogates | | | | | | | | | |
| Terphenyl-d14 <surr> | 70.3 | | % | 8270D SIMS | F | 50-135 | 07/21/08 | 07/22/08 | JDH |



SGS Ref.# 1083485002
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Client Sample ID 17207-B2MW
Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/01/2008 11:41
Collected Date/Time 07/16/2008 16:10
Received Date/Time 07/17/2008 9:18
Technical Director Stephen C. Ede

Sample Remarks:

AK102 - The pattern is consistent with a weathered gasoline.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|--------|-------|------------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | 128 | 10.0 | mg/L | AK101 | A | | 07/28/08 | 07/28/08 | HM |
| Benzene | 23500 | 50.0 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| Toluene | 33700 | 1000 | ug/L | SW8021B | A | | 07/29/08 | 07/29/08 | HM |
| Ethylbenzene | 4970 | 200 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| o-Xylene | 2520 | 200 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| P & M -Xylene | 13200 | 200 | ug/L | SW8021B | A | | 07/28/08 | 07/28/08 | HM |
| <u>Surrogates</u> | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 103 | | % | AK101 | A | 50-150 | 07/28/08 | 07/28/08 | HM |
| 1,4-Difluorobenzene <surr> | 96.8 | | % | SW8021B | A | 80-120 | 07/28/08 | 07/28/08 | HM |
| <u>Semivolatile Organic Fuels Department</u> | | | | | | | | | |
| Diesel Range Organics | 5.68 | 0.385 | mg/L | AK102 | D | | 07/25/08 | 07/27/08 | HKG |
| Residual Range Organics | ND | 0.962 | mg/L | AK103 | D | | 07/25/08 | 07/27/08 | HKG |
| <u>Surrogates</u> | | | | | | | | | |
| 5a Androstane <surr> | 77.4 | | % | AK102 | D | 50-150 | 07/25/08 | 07/27/08 | HKG |
| n-Triacontane-d62 <surr> | 80.6 | | % | AK103 | D | 50-150 | 07/25/08 | 07/27/08 | HKG |
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | | | |
| Acenaphthylene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Acenaphthene | 0.129 | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Fluorene | 0.0827 | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Phenanthrene | 0.0770 | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Anthracene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Fluoranthene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |



SGS Ref.# 1083485002
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Client Sample ID 17207-B2MW
Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/01/2008 11:41
Collected Date/Time 07/16/2008 16:10
Received Date/Time 07/17/2008 9:18
Technical Director Stephen C. Ede

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|------------------------------------|---------|--------|-------|------------|--------------|------------------|-----------|---------------|------|
| Polynuclear Aromatics GC/MS | | | | | | | | | |
| Pyrene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo(a)Anthracene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Chrysene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[b]Fluoranthene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[k]fluoranthene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[a]pyrene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Indeno[1,2,3-c,d] pyrene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Dibenzo[a,h]anthracene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Benzo[g,h,i]perylene | ND | 0.0532 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/22/08 | JDH |
| Naphthalene | 274 | 21.3 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/24/08 | JDH |
| 1-Methylnaphthalene | 32.1 | 10.6 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/24/08 | JDH |
| 2-Methylnaphthalene | 43.7 | 10.6 | ug/L | 8270D SIMS | F | | 07/21/08 | 07/24/08 | JDH |
| Surrogates | | | | | | | | | |
| Terphenyl-d14 <surr> | 70.1 | | % | 8270D SIMS | F | 50-135 | 07/21/08 | 07/22/08 | JDH |



SGS Ref.# 1083485003
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Client Sample ID 17207-TB
Matrix Water (Surface, Eff., Ground)

All Dates/Times are Alaska Standard Time
Printed Date/Time 08/01/2008 11:41
Collected Date/Time 07/16/2008 15:55
Received Date/Time 07/17/2008 9:18
Technical Director Stephen C. Ede

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---------|-------|-------|---------|--------------|------------------|-----------|---------------|------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | ND | 0.100 | mg/L | AK101 | A | | 07/28/08 | 07/29/08 | HM |
| Benzene | ND | 0.500 | ug/L | SW8021B | A | | 07/28/08 | 07/29/08 | HM |
| Toluene | ND | 2.00 | ug/L | SW8021B | A | | 07/28/08 | 07/29/08 | HM |
| Ethylbenzene | ND | 2.00 | ug/L | SW8021B | A | | 07/28/08 | 07/29/08 | HM |
| o-Xylene | ND | 2.00 | ug/L | SW8021B | A | | 07/28/08 | 07/29/08 | HM |
| P & M -Xylene | ND | 2.00 | ug/L | SW8021B | A | | 07/28/08 | 07/29/08 | HM |
| <u>Surrogates</u> | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | 101 | | % | AK101 | A | 50-150 | 07/28/08 | 07/29/08 | HM |
| 1,4-Difluorobenzene <surr> | 94.7 | | % | SW8021B | A | 80-120 | 07/28/08 | 07/29/08 | HM |



SGS Ref.# 842721 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch XXX19668
Method SW3520C
Date 07/21/2008

QC results affect the following production samples:
 1083485001, 1083485002

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|----------------------|----------------------------|--------|-------|------------------|
| <u>Polynuclear Aromatics GC/MS</u> | | | | | |
| Acenaphthylene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Acenaphthene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Fluorene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Phenanthrene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Anthracene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Fluoranthene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Pyrene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Benzo(a)Anthracene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Chrysene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Benzo[b]Fluoranthene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Benzo[k]fluoranthene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Benzo[a]pyrene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Indeno[1,2,3-c,d] pyrene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Dibenzo[a,h]anthracene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Benzo[g,h,i]perylene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Naphthalene | ND | 0.100 | 0.0310 | ug/L | 07/22/08 |
| 1-Methylnaphthalene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| 2-Methylnaphthalene | ND | 0.0500 | 0.0150 | ug/L | 07/22/08 |
| Surrogates | | | | | |
| Terphenyl-d14 <surr> | 73.8 | 50-135 | | % | 07/22/08 |
| Batch | XMS4625 | | | | |
| Method | 8270D SIMS | | | | |
| Instrument | HP 6890/5973 MS SVOA | | | | |



SGS Ref.# 843859 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch XXX19700
Method SW3520C
Date 07/25/2008

QC results affect the following production samples:
1083485001, 1083485002

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|--|------------------------------|-------------------------|--------|-------|---------------|
| Semivolatile Organic Fuels Department | | | | | |
| Diesel Range Organics | 0.0827 J | 0.400 | 0.0800 | mg/L | 07/26/08 |
| Surrogates | | | | | |
| 5a Androstane <surr> | 84.2 | 60-120 | | % | 07/26/08 |
| Batch | XFC8070 | | | | |
| Method | AK102 | | | | |
| Instrument | HP 5890 Series II FID SV D R | | | | |
| Residual Range Organics | 0.401 J | 1.00 | 0.100 | mg/L | 07/26/08 |
| Surrogates | | | | | |
| n-Triacontane-d62 <surr> | 85.7 | 60-120 | | % | 07/26/08 |
| Batch | XFC8070 | | | | |
| Method | AK103 | | | | |
| Instrument | HP 5890 Series II FID SV D R | | | | |



SGS Ref.# 844678 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18439
Method SW5030B
Date 07/28/2008

QC results affect the following production samples:
1083485001, 1083485002, 1083485003

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|-----------|---------|----------------------------|-----|-------|------------------|
|-----------|---------|----------------------------|-----|-------|------------------|

Volatile Fuels Department

Gasoline Range Organics ND 0.100 0.0100 mg/L 07/28/08

Surrogates

4-Bromofluorobenzene <surr> 89.7 50-150 % 07/28/08

Batch VFC9075
Method AK101
Instrument HP 5890 Series II PID+FID VCA

Benzene ND 0.500 0.150 ug/L 07/28/08

Toluene ND 2.00 0.620 ug/L 07/28/08

Ethylbenzene ND 2.00 0.620 ug/L 07/28/08

o-Xylene ND 2.00 0.620 ug/L 07/28/08

P & M -Xylene ND 2.00 0.620 ug/L 07/28/08

Surrogates

1,4-Difluorobenzene <surr> 95.6 80-120 % 07/28/08

Batch VFC9075
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 844694 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18439
Method SW5030B
Date 07/28/2008

QC results affect the following production samples:
1083485001, 1083485002, 1083485003

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|-----------|---------|----------------------------|-----|-------|------------------|
|-----------|---------|----------------------------|-----|-------|------------------|

Volatile Fuels Department

| | | | | | |
|-------------------------|----|-------|--------|------|----------|
| Gasoline Range Organics | ND | 0.100 | 0.0100 | mg/L | 07/28/08 |
|-------------------------|----|-------|--------|------|----------|

Surrogates

| | | | | | |
|-----------------------------|------|--------|--|---|----------|
| 4-Bromofluorobenzene <surr> | 91.2 | 50-150 | | % | 07/28/08 |
|-----------------------------|------|--------|--|---|----------|

Batch VFC9075
Method AK101
Instrument HP 5890 Series II PID+FID VCA

| | | | | | |
|---------------|----|-------|-------|------|----------|
| Benzene | ND | 0.500 | 0.150 | ug/L | 07/28/08 |
| Toluene | ND | 2.00 | 0.620 | ug/L | 07/28/08 |
| Ethylbenzene | ND | 2.00 | 0.620 | ug/L | 07/28/08 |
| o-Xylene | ND | 2.00 | 0.620 | ug/L | 07/28/08 |
| P & M -Xylene | ND | 2.00 | 0.620 | ug/L | 07/28/08 |

Surrogates

| | | | | | |
|----------------------------|------|--------|--|---|----------|
| 1,4-Difluorobenzene <surr> | 92.4 | 80-120 | | % | 07/28/08 |
|----------------------------|------|--------|--|---|----------|

Batch VFC9075
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 844881 Method Blank
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18446
Method SW5030B
Date 07/29/2008

QC results affect the following production samples:
1083485001, 1083485002

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|-----------|---------|-------------------------|-----|-------|---------------|
|-----------|---------|-------------------------|-----|-------|---------------|

Volatile Fuels Department

Surrogates

| | | | | | |
|-----------------------------|-------------------------------|--------|--|---|----------|
| 4-Bromofluorobenzene <surr> | 105 | 50-150 | | % | 07/29/08 |
| Batch | VFC9078 | | | | |
| Method | AK101 | | | | |
| Instrument | HP 5890 Series II PID+FID VCA | | | | |

| | | | | | |
|---------|----|------|-------|------|----------|
| Toluene | ND | 2.00 | 0.620 | ug/L | 07/29/08 |
|---------|----|------|-------|------|----------|

Surrogates

| | | | | | |
|----------------------------|-------------------------------|--------|--|---|----------|
| 1,4-Difluorobenzene <surr> | 94.3 | 80-120 | | % | 07/29/08 |
| Batch | VFC9078 | | | | |
| Method | SW8021B | | | | |
| Instrument | HP 5890 Series II PID+FID VCA | | | | |



SGS Ref.# 842722 Lab Control Sample
 842723 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch XXX19668
Method SW3520C
Date 07/21/2008

QC results affect the following production samples:
 1083485001, 1083485002

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|------------|-----------|-----------------|------------|------------|---------------|---------------|
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | |
| Acenaphthylene | LCS | 0.314 | 63 | (50-105) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.312 | 63 | | 1 (< 30) | 0.5 ug/L | 07/22/2008 |
| Acenaphthene | LCS | 0.298 | 60 | (45-110) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.294 | 59 | | 1 (< 30) | 0.5 ug/L | 07/22/2008 |
| Fluorene | LCS | 0.314 | 63 | (50-110) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.312 | 63 | | 0 (< 30) | 0.5 ug/L | 07/22/2008 |
| Phenanthrene | LCS | 0.323 | 65 | (50-115) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.318 | 64 | | 2 (< 30) | 0.5 ug/L | 07/22/2008 |
| Anthracene | LCS | 0.349 | 70 | (55-110) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.333 | 67 | | 5 (< 30) | 0.5 ug/L | 07/22/2008 |
| Fluoranthene | LCS | 0.346 | 69 | (55-125) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.336 | 67 | | 3 (< 30) | 0.5 ug/L | 07/22/2008 |
| Pyrene | LCS | 0.337 | 67 | (50-130) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.324 | 65 | | 4 (< 30) | 0.5 ug/L | 07/22/2008 |
| Benzo(a)Anthracene | LCS | 0.360 | 72 | (55-120) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.357 | 72 | | 1 (< 30) | 0.5 ug/L | 07/22/2008 |
| Chrysene | LCS | 0.354 | 71 | (55-120) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.331 | 66 | | 7 (< 30) | 0.5 ug/L | 07/22/2008 |
| Benzo[b]Fluoranthene | LCS | 0.322 | 64 | (46-130) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.320 | 64 | | 0 (< 30) | 0.5 ug/L | 07/22/2008 |
| Benzo[k]fluoranthene | LCS | 0.366 | 73 | (60-125) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.357 | 72 | | 3 (< 30) | 0.5 ug/L | 07/22/2008 |
| Benzo[a]pyrene | LCS | 0.428 | 86 | (55-120) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.422 | 84 | | 1 (< 30) | 0.5 ug/L | 07/22/2008 |
| Indeno[1,2,3-c,d] pyrene | LCS | 0.372 | 74 | (45-125) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.379 | 76 | | 2 (< 30) | 0.5 ug/L | 07/22/2008 |



SGS Ref.# 842722 Lab Control Sample
 842723 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch XXX19668
Method SW3520C
Date 07/21/2008

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|------------|-----------|-----------------|------------|------------|---------------|---------------|
| <u>Polynuclear Aromatics GC/MS</u> | | | | | | | |
| Dibenzo[a,h]anthracene | LCS | 0.402 | 80 | (41-140) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.393 | 79 | | 2 (< 30) | 0.5 ug/L | 07/22/2008 |
| Benzo[g,h,i]perylene | LCS | 0.378 | 76 | (46-125) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.371 | 74 | | 2 (< 30) | 0.5 ug/L | 07/22/2008 |
| Naphthalene | LCS | 0.286 | 57 | (42-100) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.282 | 57 | | 1 (< 30) | 0.5 ug/L | 07/22/2008 |
| 1-Methylnaphthalene | LCS | 0.292 | 58 | (46-115) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.287 | 58 | | 2 (< 30) | 0.5 ug/L | 07/22/2008 |
| 2-Methylnaphthalene | LCS | 0.296 | 59 | (45-105) | | 0.5 ug/L | 07/22/2008 |
| | LCSD | 0.294 | 59 | | 1 (< 30) | 0.5 ug/L | 07/22/2008 |
| Surrogates | | | | | | | |
| Terphenyl-d14 <surr> | LCS | | 69 | (50-135) | | | 07/22/2008 |
| | LCSD | | 68 | | 2 | | 07/22/2008 |

Batch XMS4625
Method 8270D SIMS
Instrument HP 6890/5973 MS SVOA



SGS Ref.# 843860 Lab Control Sample
843861 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch XXX19700
Method SW3520C
Date 07/25/2008

QC results affect the following production samples:

1083485001, 1083485002

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Semivolatile Organic Fuels Department

| | | | | | | | |
|-----------------------|-----------|----|------------|---|---------|---------|------------|
| Diesel Range Organics | LCS 16.5 | 83 | (75-125) | | | 20 mg/L | 07/26/2008 |
| | LCSD 16.2 | 81 | | 2 | (< 20) | 20 mg/L | 07/26/2008 |

Surrogates

| | | | | | | | |
|----------------------|------|-----|------------|---|--|--|------------|
| 5a Androstane <surr> | LCS | 100 | (60-120) | | | | 07/26/2008 |
| | LCSD | 99 | | 1 | | | 07/26/2008 |

Batch XFC8070
Method AK102
Instrument HP 5890 Series II FID SV D R

| | | | | | | | |
|-------------------------|-----------|----|------------|---|---------|---------|------------|
| Residual Range Organics | LCS 16.7 | 84 | (60-120) | | | 20 mg/L | 07/26/2008 |
| | LCSD 17.3 | 86 | | 3 | (< 20) | 20 mg/L | 07/26/2008 |

Surrogates

| | | | | | | | |
|--------------------------|------|----|------------|---|--|--|------------|
| n-Triacontane-d62 <surr> | LCS | 88 | (60-120) | | | | 07/26/2008 |
| | LCSD | 87 | | 1 | | | 07/26/2008 |

Batch XFC8070
Method AK103
Instrument HP 5890 Series II FID SV D R



SGS Ref.# 844679 Lab Control Sample
 844680 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18439
Method SW5030B
Date 07/28/2008

QC results affect the following production samples:
 1083485001, 1083485002, 1083485003

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|------------|-----------|-----------------|------------|------------|---------------|---------------------|
| <u>Volatile Fuels Department</u> | | | | | | | |
| Benzene | LCS | 113 | 113 | (80-120) | | 100 ug/L | 07/28/2008 |
| | LCSD | 114 | 114 | | 2 | (< 20) | 100 ug/L 07/28/2008 |
| Toluene | LCS | 105 | 105 | (80-120) | | 100 ug/L | 07/28/2008 |
| | LCSD | 107 | 107 | | 2 | (< 20) | 100 ug/L 07/28/2008 |
| Ethylbenzene | LCS | 109 | 109 | (87-125) | | 100 ug/L | 07/28/2008 |
| | LCSD | 112 | 112 | | 2 | (< 20) | 100 ug/L 07/28/2008 |
| o-Xylene | LCS | 107 | 107 | (85-120) | | 100 ug/L | 07/28/2008 |
| | LCSD | 109 | 109 | | 2 | (< 20) | 100 ug/L 07/28/2008 |
| P & M -Xylene | LCS | 217 | 108 | (87-125) | | 200 ug/L | 07/28/2008 |
| | LCSD | 222 | 111 | | 2 | (< 20) | 200 ug/L 07/28/2008 |
| Surrogates | | | | | | | |
| 1,4-Difluorobenzene <surr> | LCS | | 98 | (80-120) | | | 07/28/2008 |
| | LCSD | | 97 | | 1 | | 07/28/2008 |

Batch VFC9075
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 844681 Lab Control Sample
844682 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18439
Method SW5030B
Date 07/28/2008

QC results affect the following production samples:
1083485001, 1083485002, 1083485003

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Volatile Fuels Department

| | | | | | | | |
|-------------------------|------|-------|-----|------------|---|------------|-----------------------|
| Gasoline Range Organics | LCS | 0.201 | 100 | (60-120) | | 0.200 mg/L | 07/28/2008 |
| | LCSD | 0.197 | 99 | | 2 | (< 20) | 0.200 mg/L 07/28/2008 |

Surrogates

| | | | | | | | |
|-----------------------------|------|--|----|------------|---|--|------------|
| 4-Bromofluorobenzene <surr> | LCS | | 91 | (50-150) | | | 07/28/2008 |
| | LCSD | | 91 | | 1 | | 07/28/2008 |

Batch VFC9075
Method AK101
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 844882 Lab Control Sample
844883 Lab Control Sample Duplicate
Client Name Shannon & Wilson Inc.
Project Name/# 32-1-17207 4350 MacInnes St.
Matrix Water (Surface, Eff., Ground)

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18446
Method SW5030B
Date 07/29/2008

QC results affect the following production samples:

1083485001, 1083485002

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|
|-----------|------------|-----------|-----------------|-----|------------|---------------|---------------|

Volatile Fuels Department

| | | | | | | | |
|---------|-----------|-----|------------|---|---------|----------|------------|
| Toluene | LCS 99.6 | 100 | (80-120) | | | 100 ug/L | 07/29/2008 |
| | LCSD 99.4 | 99 | | 0 | (< 20) | 100 ug/L | 07/29/2008 |

Surrogates

| | | | | | | | |
|----------------------------|------|----|------------|---|--|--|------------|
| 1,4-Difluorobenzene <surr> | LCS | 96 | (80-120) | | | | 07/29/2008 |
| | LCSD | 96 | | 1 | | | 07/29/2008 |

Batch VFC9078
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 844688 Matrix Spike
844689 Matrix Spike Duplicate

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18439
Method Volatile Fuels Extraction (W)
Date 07/28/2008

Original 844687
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:

1083485001, 1083485002, 1083485003

| Parameter | Qualifiers | Original Result | QC Result | Pet Recov | MS/MSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|------------|-----------------|-----------|-----------|---------------|-----|------------|---------------|-----------------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Benzene | MS | ND | 46.5 | 93 | (80-120) | | | 50.0 | ug/L 07/28/2008 |
| | MSD | | 48.1 | 96 | | 3 | (< 20) | 50.0 | ug/L 07/28/2008 |
| Toluene | MS | ND | 44.7 | 89 | (80-120) | | | 50.0 | ug/L 07/28/2008 |
| | MSD | | 46.5 | 93 | | 4 | (< 20) | 50.0 | ug/L 07/28/2008 |
| Ethylbenzene | MS | ND | 46.9 | 94 | (87-125) | | | 50.0 | ug/L 07/28/2008 |
| | MSD | | 49.1 | 98 | | 5 | (< 20) | 50.0 | ug/L 07/28/2008 |
| o-Xylene | MS | ND | 46.8 | 94 | (85-120) | | | 50.0 | ug/L 07/28/2008 |
| | MSD | | 48.6 | 97 | | 4 | (< 20) | 50.0 | ug/L 07/28/2008 |
| P & M -Xylene | MS | ND | 94.8 | 95 | (87-125) | | | 100 | ug/L 07/28/2008 |
| | MSD | | 99.0 | 99 | | 4 | (< 20) | 100 | ug/L 07/28/2008 |
| Surrogates | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | MS | | 48.7 | 97 | (80-120) | | | | 07/28/2008 |
| | MSD | | 48.6 | 97 | | 0 | | | 07/28/2008 |

Batch VFC9075
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA



SGS Ref.# 844690 Matrix Spike
844691 Matrix Spike Duplicate

Printed Date/Time 08/01/2008 11:41
Prep Batch VXX18439
Method Volatile Fuels Extraction (W)
Date 07/28/2008

Original 844687
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:
1083485001, 1083485002, 1083485003

| Parameter | Qualifiers | Original Result | QC Result | Pet Recov | MS/MSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|-------------------------------|-----------------|-----------|-----------|---------------|-----|------------|---------------|-----------------|
| <u>Volatile Fuels Department</u> | | | | | | | | | |
| Gasoline Range Organics | MS | ND | 0.399 | 89 | (60-120) | | | 0.450 | mg/L 07/28/2008 |
| | MSD | | 0.381 | 85 | | 5 | (< 20) | 0.450 | mg/L 07/28/2008 |
| Surrogates | | | | | | | | | |
| 4-Bromofluorobenzene <surr> | MS | | 0.0449 | 90 | (50-150) | | | | 07/28/2008 |
| | MSD | | 0.0453 | 91 | | 1 | | | 07/28/2008 |
| Batch | VFC9075 | | | | | | | | |
| Method | AK101 | | | | | | | | |
| Instrument | HP 5890 Series II PID+FID VCA | | | | | | | | |



SAMPLE RECEIPT FORM

SGS WO#:

Yes No NA

- Are samples RUSH, priority or w/in 72 hrs of hold time?
- If yes, have you done e-mail ALERT notification?
- Are samples within 24 hrs. of hold time or due date?
- If yes, have you also spoken with supervisor?
- Archiving bottles (if req'd): Are they properly marked?
- Are there any problems? PM Notified? _____
- Were samples preserved correctly and pH verified?

- If this is for PWS, provide PWSID. _____
- Will courier charges apply?
- Method of payment? _____
- Data package required? (Level: 1 / 2 / 3 / 4)
- Notes: _____
- Is this a DoD project? (USACE, Navy, AFCEE)

TAT (circle one): Standard -or- Rush

Received Date: 7-17-08

Received Time: 0918

Is date/time conversion necessary? N

of hours to AK Local Time: _____

Thermometer ID: 69D

| Cooler ID | Temp Blank | Cooler Temp |
|-----------|---------------|---------------|
| <u>1</u> | <u>2.9</u> °C | <u>3.8</u> °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |
| _____ | _____ °C | _____ °C |

Note: Temperature readings include thermometer correction factors

Delivery method (circle all that apply): Client /

- Alert Courier / UPS / FedEx / USPS / DHL /
- AA Goldstreak / NAC / ERA / PenAir / Carlisle /
- Lynden / SGS / Other: _____

Airbill # _____

Additional Sample Remarks: (if applicable)

- Extra Sample Volume?
- Limited Sample Volume?
- MeOH field preserved for volatiles?
- Field-filtered for dissolved _____
- Lab-filtered for dissolved _____
- Ref Lab required? _____
- Foreign Soil?

This section must be filled out for DoD projects (USACE, Navy, AFCEE)

| Yes | No | | Samples/Analyses Affected: |
|-------|-------|--|----------------------------|
| _____ | _____ | Is received temperature $4 \pm 2^\circ\text{C}$? | _____ |
| _____ | _____ | Exceptions: _____ | _____ |
| _____ | _____ | If temperature(s) $< 0^\circ\text{C}$, were containers ice-free? <u>N/A</u> | _____ |
| _____ | _____ | <i>Notify PM immediately of any ice in samples</i> | _____ |
| _____ | _____ | Was there an airbill? (<i>Note # above in the right hand column</i>) | _____ |
| _____ | _____ | Was cooler sealed with custody seals? | _____ |
| _____ | _____ | # / where: _____ | _____ |
| _____ | _____ | Were seal(s) intact upon arrival? | _____ |
| _____ | _____ | Was there a COC with cooler? | _____ |
| _____ | _____ | Was COC sealed in plastic bag & taped inside lid of cooler? | _____ |
| _____ | _____ | Was the COC filled out properly? | _____ |
| _____ | _____ | Did the COC indicate USACE / Navy / AFCEE project? | _____ |
| _____ | _____ | Did the COC and samples correspond? | _____ |
| _____ | _____ | Were all sample packed to prevent breakage? | _____ |
| _____ | _____ | Packing material: _____ | _____ |
| _____ | _____ | Were all samples unbroken and clearly labeled? | _____ |
| _____ | _____ | Were all samples sealed in separate plastic bags? | _____ |
| _____ | _____ | Were all VOCs free of headspace and/or MeOH preserved? | _____ |
| _____ | _____ | Were correct container / sample sizes submitted? | _____ |
| _____ | _____ | Is sample condition good? | _____ |
| _____ | _____ | Was copy of CoC, SRF, and custody seals given to PM to fax? | _____ |

This section must be filled if problems are found.

Yes No
_____ Was client notified of problems?

Individual contacted: _____

Via: Phone / Fax / Email (*circle one*)

Date/Time: _____

Reason for contact: _____

Change Order Required? _____

SGS Contact: _____

Notes: per Nick, please analyze PATT samples 7/18 bar

Completed by (sign):

(print): Jana Johnson

Login proof (check one): waived required performed by: _____

Laboratory Data Review Checklist

Completed by:

Title:

Date:

CS Report Name:

Report Date:

Consultant Firm:

Laboratory Name:

Laboratory Report Number:

ADEC File Number:

ADEC RecKey Number:

1. Laboratory

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

Yes No

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

Comments:

2. Chain of Custody (COC)

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

Yes No

Comments:

b. Correct analyses requested?

Yes No

Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?

Yes No

Comments:

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

Yes No

Comments:

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

Yes No

Comments:

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

Yes No

Comments:

e. Data quality or usability affected? Explain.

Comments:

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

c. Were all corrective actions documented?

Yes No

Comments:

NA

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

Comments:

None

5. Samples Results

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

Yes No

Comments:

b. All applicable holding times met?

Yes No

Comments:

c. All soils reported on a dry weight basis?

Yes No

Comments:

NA

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

Yes No

Comments:

e. Data quality or usability affected? Explain.

Comments:

NO

6. QC Samples

a. Method Blank

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

Yes No

Comments:

ii. All method blank results less than PQL?

Yes No

Comments:

iii. If above PQL, what samples are affected?

Comments:

NA

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

Yes No

Comments:

NA

v. Data quality or usability affected? Explain.

Comments:

NO

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples?

Yes No

Comments:

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

Yes No

Comments:

NA

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

Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No

Comments:

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

Comments:

NA

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

Yes No

Comments:

NA

vii. Data quality or usability affected? Explain.

Comments:

NO

c. Surrogates – Organics Only

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

Yes No

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

Comments:

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

Yes No

Comments:

NA

iv. Data quality or usability affected? Explain.

Comments:

NO

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?

Yes No

Comments:

ii. All results less than PQL?

Yes No

Comments:

iii. If above PQL, what samples are affected?

Comments:

iv. Data quality or usability affected? Explain.

Comments:

e. Field Duplicate

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

Yes No

Comments:

ii. Submitted blind to lab?

Yes No

Comments:

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No

Comments:

iv. Data quality or usability affected? Explain.

Comments:

f. Decontamination or Equipment Blank (if applicable)

Yes No Not Applicable

i. All results less than PQL?

Yes No Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? Explain.

Comments:

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

a. Defined and appropriate?

Yes No Comments:

ATTACHMENT 4

**IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT**



Date: December 2008
To: Municipality of Anchorage
Re: Well Installation and Groundwater Sampling,
4350 MacInnes Street, Anchorage, 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