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2015 Groundwater Monitoring Report

Ralph Wein Memorial Airport, Kotzebue, Alaska

Alaska Airlines

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2015 Groundwater Monitoring Report
Ralph Wein Memorial Airport, Kotzebue, Alaska

Prepared for:

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ACRONYMS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AS	Alaska Airlines
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
ºC	degrees Celsius
COC	chain of custody
DRO	diesel range organics
DQA	Data Quality Assessment
GRO	gasoline range organics
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
mg/L	milligrams per liter
PAH	polycyclic aromatic hydrocarbon
PID	photoionization detector
PVC	polyvinylchloride
QA	quality assurance
QC	quality control
RPD	Relative percent difference
SIM	selective ion monitoring
SLR	SLR International Corporation
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

SUMMARY

SLR International Corporation (SLR) completed groundwater monitoring and well replacement activities at the Alaska Airlines, Inc. (AS) lease property, Block 1 Lots E, F, and G, located at the Ralph Wein Memorial Airport (Site) between September 30 to October 2, 2015. This property is also identified by Alaska Department of Environmental Conservation (ADEC) File Number 410.26.005 and Hazard ID Number 24439.

Monitoring well MW-1 was unable to be located and was replaced by new well MW-1R. Monitoring well MW-3 was damaged beyond repair and was replaced by MW-3R. A new surface completion was installed at MW-2.

Groundwater samples were collected from all three wells and analyzed for gasoline range organics (GRO), diesel range organics (DRO) and volatile organic compounds (VOCs). Samples from MW-1R and MW-3R were also analyzed for polycyclic aromatic hydrocarbons (PAHs).

VOCs were detected in groundwater samples from wells MW-1R, MW-2, and MW-3R; however, with the exception of benzene, all VOC concentrations were below ADEC groundwater cleanup levels. Concentrations above the method limits of detection were reported for a few PAHs, however, none exceeded an ADEC groundwater cleanup level.

At MW-1R, GRO, DRO, and benzene concentrations have decreased since 2000 relative to the historical results from the lost monitoring well MW-1. At MW-3R, GRO and benzene concentrations have decreased since 2000 relative to the historical results from abandoned well MW-3; however, DRO concentrations appear to have increased. A similar trend occurs at MW-2.

In September 2015, the groundwater flow direction beneath the Site was inferred to be to the northwest. However, given the very low gradient calculated for during the 2015 event (0.0015 to the northwest), the transient nature of suprapermafrost groundwater, and the small number of historical data points, a “normal” flow direction is difficult to estimate.

Soil waste characterization analyses for DRO, GRO, VOCs, and PAHs showed that concentrations for all tested analytes were below the ADEC Method Two soil cleanup level for migration to groundwater. These results indicate that the source of the groundwater contamination is not in the immediate vicinity of the wells tested and may be located offsite.

Finally, SLR field staff completed an *ADEC Building Survey and Indoor Air Sampling Questionnaire.* Potential sources were detected in the large garage area which is well ventilated. A photoionization detector (PID) was used to screen for the presence or absence of total volatile hydrocarbon in the building. All PID readings were non-detect. The slab on grade concrete foundation was found to be in good condition with no significant cracks

1. INTRODUCTION

SLR International Corporation (SLR) is pleased to submit this Groundwater Monitoring Report for the Alaska Airlines, Inc. (AS) lease property, Block 1 Lots E, F, and G, located at the Ralph Wein Memorial Airport (Site) (Figure 1). This property is also identified by Alaska Department of Environmental Conservation (ADEC) File Number 410.26.005 and Hazard ID Number 24439. This report describes the field activities performed on September 30 to October 2, 2015 at the Site and presents the associated laboratory results.

1.1 SITE DESCRIPTION AND BACKGROUND

The AS facility is located at Wein Memorial Airport on Alaska Department of Transportation and Public Facilities lease Lots E, F, and G, Block 1. It includes a two-story terminal building, fueling area, and cargo storage area to the west of the terminal building (Figure 2).

The Kotzebue area is underlain by continuous permafrost with a near-surface soil layer that freezes and thaws annually (i.e., an “active layer”). Beneath undeveloped areas, the active layer is typically less than 2 feet thick. In developed areas, such as beneath the AS terminal facility, seasonal thaw depths of up to 10 feet may be present (URS, 2001). Suprapermafrost groundwater (i.e., water above the permafrost layer) exists beneath the airport area and has been observed at between 2 to 5 feet below ground surface (bgs). Based on suprapermafrost groundwater elevations measured in 2000, the water flow beneath the AS terminal facility was estimated to be to the east, toward Kotzebue Lagoon. However, because of the transient nature of the suprapermafrost groundwater, specific flow gradients are difficult to determine.

The airport is bordered by surface water with Kotzebue Sound located to the west and Kotzebue Lagoon to the east (Figure 1). Due to permafrost conditions, which limit the quantity of available water and the brackish quality of the saturated zone, suprapermafrost water in the Kotzebue area is not used as a drinking water source (Maul Foster & Alongi, Inc. and SLR Alaska, 2003). Water for domestic use is piped to Kotzebue from Vortac and Devil’s Lakes located more than one mile east and upgradient of the airport (U.S. Geological Survey, 1995).

Based on the operational history of the site, four areas of concern were identified and investigated in 2000. The AOCs included: the area around a former 550-gallon gasoline underground storage tank (UST) which was removed in 1994; the area around the 10,000-gallon Jet A UST used to supply fuel to an aircraft refueling hydrant system and the terminal building heating system; the area southwest of the AS terminal; and the area near a former heating oil aboveground storage tank and fuel line that was used during construction of the AS terminal building in the mid-1980s.

The Site was last sampled 2010, but only monitoring well MW-2 was sampled. Monitoring well MW-1 was not found and monitoring well MW-3 was found to be broken. Analytical results from the October 2010 sampling event included decreased gasoline range organics (GRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations, and increased diesel residual organics (DRO) concentrations since 2002. Decommissioning and replacement of

monitoring wells MW-1 and MW-3 were recommended along with additional groundwater sampling at the site.

1.2 PROJECT OBJECTIVES AND SCOPE OF WORK

Based on recommendations from the 2010 Ground Water Monitoring Report (SLR, 2010), the objectives and scope of work for this sampling event were as follows:

- Replace flush mount lid at monitoring well MW-2;
- Abandon monitoring well MW-3;
- Replace monitoring wells MW-1 and MW-3,
- Collect groundwater samples from monitoring well MW-2 and from replacement monitoring wells MW-1R and MW-3R, and analyze samples for GRO, DRO, and volatile organic compounds (VOCs) including BTEX, and polycyclic aromatic hydrocarbons (PAHs) at MW-1R and MW-2R only; and
- Complete a vapor intrusion building survey in accordance with ADEC Vapor Intrusion Guidance, Appendix I (ADEC, 2012)

The scope of work was completed consistent with the *2015 Groundwater Monitoring Work Plan, Alaska Airlines Kotzebue Facility* (Work Plan) *(*SLR, 2015), ADEC correspondence dated March 4, 2015, and telephone conversations between ADEC, SLR, and Alaska Air..

2. REGULATORY CRITERIA

ADEC regulations applicable to this project are contained in Title 18 of Alaska Administrative Code (AAC), Chapter 75 Oil and Other Hazardous Substances Pollution Control (18 AAC 75), as updated on June 17, 2015 (ADEC, 2015). This section describes the cleanup criteria that currently apply to groundwater at the property.

2.1 GROUNDWATER REGULATORY CRITERIA

Groundwater cleanup levels are presented in 18 AAC 75.345, Table C, and are summarized below for the relevant analytes.

- Benzene, 0.005 milligrams per liter (mg/L);
- Toluene, 1.0 mg/L;
- Ethylbenzene, 0.7 mg/L;
- Total xylenes, 10.0 mg/L;
- GRO, 2.2 mg/L; and
- DRO, 1.5 mg/L.

Groundwater cleanup levels for the complete list of VOCs and PAHs analyzed are provided with the results in Table 1.

3. FIELD ACTIVITIES

To accomplish the proposed 2015 scope of work at the Site the following field activities were completed:

- Abandoned monitoring well MW-3;
- Replaced monitoring wells MW-1 and MW-3 with new wells MW-1R and MW-3R;
- Replaced flush mount surface completion at MW-2;
- Collected soil samples from wellbores MW-1R and MW-3R, and from containerized soil cuttings, for disposal characterization;
- Collected groundwater samples from monitoring wells MW-1R, MW-2, and MW-3R;
- Surveyed three wells and calculate groundwater flow direction; and
- Complete *ADEC Building Survey and Indoor Air Sampling Questionnaire* for the AS terminal property.

Drilling oversight and sampling was conducted by SLR. The SLR field staff met the criteria for "qualified environmental professional" under 18 AAC 75.333(c). All field activities were completed consistent with the Work Plan.

3.1 SITE CONDITIONS

Upon arrival at the Site, the weather was slightly above freezing with occasional snow showers. The project area had a light cover of snow and slush in places, but was mostly bare and wet. Alaska Airlines operations equipment was staged around monitoring well MW-2. The area near MW-3 was mostly clear. As previously reported, no evidence of well MW-1 was found.

Monitoring well MW-2 was located but was missing its monument cover. The remaining parts of the flush-mount vault were damaged, but the polyvinylchloride (PVC) well casing was intact and was sealed with a standard compression well cap. The well was determined to be operational and able to be sampled.

Monitoring well MW-3 was located and found to be damaged and not repairable, as previously reported (Photograph 1 of Appendix A). The upper-most piece of casing was broken at the surface and the upper 3-feet of casing came loose when pulled. The section below the upper 3-feet of casing was obstructed and could not be cleared.

Well locations are shown on Figure 2.

3.2 ABANDON MONITORING WELL MW-3

Monitoring well MW-3 was abandoned on September 30, 2015. The flush mount vault was removed and approximately 3-feet of casing were pulled from the wellbore. The end of the pulled casing was plugged with bentonite. It was not possible to remove the deeper sections of casing and screen without over drilling. As a result, the casing and screen material below 3-feet bgs were left in place.

The casing remaining in the ground was filled with bentonite chips. The bentonite was applied in 1-foot lifts, and each lift was hydrated with potable water. Clean fill material was used to backfill the hole from 3-feet bgs to the surface (Photograph 2 of Appendix A).

3.3 DRILLING AND WELL INSTALLATION

Replacement wells for MW-1 and MW-3 were installed on September 30, 2015 consistent with *ADEC Monitoring Well Guidance* (ADEC, 2013). Prior to drilling, SLR marked the replacement well locations, MW-1R and MW-3R (Figure 2) and contacted the Alaska Dig Line. No public utilities were found beneath the drilling locations; however, based on observations in the area, buried private electrical lines were identified. Borings were located to avoid the electrical lines based on surface disturbances (i.e., old cuts in the asphalt) and aboveground expressions (e.g., junction boxes and cables enter the ground) identified on adjacent building and light post.

Drake Construction (Drake) of Kotzebue, Alaska was contracted to drill the two new well borings. MW-1R was drilled in the area near former monitoring well MW-1, and MW-3R was drilled approximately 2 feet north of abandoned monitoring well MW-3.

For monitoring well MW-3R, Drake initially used a 6-foot long, 8-inch wide auger mounted on a front loader and drilled to approximately 6-feet bgs MW-3R (Photograph 3 of Appendix A); however, because the saturated zone was not observed additional drilling was required. To drill beyond 6-feet bgs, Drake used a truck-mounted rig with an extendable 12-inch wide auger (Photograph 4 of Appendix A). The saturated zone at MW-3R was encountered at just below 6-feet bgs and water quickly filled the boring to approximately 3-feet bgs. The drill rig met refusal, in what was assumed to be frozen soil, at between 6- and 7-feet bgs.

Monitoring well MW-3R was constructed with 4.5-foot pre-packed well screen (slot size 010) installed between 6-feet and 1.5-feet bgs. A section of PVC blank casing was treaded into the top of the screen, initially extending it above the ground surface, and a PVC end capped was screwed onto the bottom of the screen (Photograph 5 of Appendix A). Silica sand (10/20 sieve size) was poured into the boring around the screen to a depth of 1.5-feet bgs and bentonite chips were installed and hydrated on top the sand pack to a depth of 0.5 feet. Clean sand and gravel was used to backfill from 0.5-feet bgs to the surface. A new flush mount vault was installed at the surface and the PVC riser was cut fit within the vault.

Monitoring Well MW-1R was drilled using the truck-mounted rig with the extendable 12-inch wide auger. At MW-1R the saturated zone was encountered at approximately 6-feet bgs. Once the saturated zone was penetrated, water quickly filled in the boring to approximately 3-feet bgs. Similar to well boring MW-3R, the drill rig met refusal just below 6-feet bgs, due to what was assumed to be frozen soil.

Monitoring well MW-1R was constructed with 4.2-foot pre-packed well screen (slot size 010) installed between 5.7-feet and 1.5-feet bgs. A section of PVC blank casing was treaded into the top of the screen, initially extending it above the ground surface, and a PVC end capped was screwed onto the bottom of the screen. Silica sand (10/20 sieve size) was poured into the boring around the screen to a depth of 1.5-feet bgs and bentonite chips were installed and hydrated on top the sand pack to a depth of 0.5 feet. Clean sand and gravel was used to backfill

from 0.5-feet bgs to the surface. A new flush mount vault was installed at the surface and the PVC riser was cut to fit within the vault (Photograph 7 of Appendix A).

The new monitoring wells were developed the following day using a Waterra pump and surge block system. Simultaneous pumping and surging was conducted producing approximately 2 gallons of water. Following development the water appeared brown and cloudy.

Well development forms and well construction diagrams for MW-1R and MW-3R are provided in Appendix B.

3.4 WASTE CHARACTERIZATION SOIL SAMPLING

Less than 1 cubic yard of drill cuttings were generated during the installation of MW-1R and MW-3R. Cuttings from each boring were containerized in a single super sack.

Waste characterization samples were collected from the auger flights using disposable stainless steel spoons at each boring from the interval between 1- to 6-feet bgs. One composite sample was also collected from the super sack. All samples were analyzed for GRO by Alaska Method 101 (AK101), DRO by AK 102, and VOCs by United States Environmental Protection (USEPA) Agency Method 8260B.

Soil descriptions and sampling depths were recorded on Soil Sampling Forms provide in Appendix B.

3.5 MW-2 SURFACE REPAIR

Monitoring well MW-2 had unrepairable damage to its flush mount vault but the well itself was still usable. Therefore, the old vault was pulled out of the ground and a new vault was installed around the PVC riser (Photographs 8 and 9 of Appendix A). The PVC riser was cut approximately 0.25-feet below the rim of the vault to avoid pushing on the lid in the future. A new compression plug was also installed.

3.6 GROUNDWATER SAMPLING

Groundwater samples were collected from each monitoring well consistent with low-flow purging and sampling methodology, as outlined in *Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground-Water Sample Collection* (USEPA, 2010). Well purging was conducted using a peristaltic pump with an adjustable flow rate, new disposable Teflon®-lined sample tubing, a flow-through cell, and a YSI 556 multi-parameter water quality meter.

Water quality parameters were measured at regular intervals during purging and were recorded on Groundwater Sample Logs (Appendix B). Purging was considered complete once water quality parameters (i.e., temperature, pH, and specific conductance) had stabilized. The readings were considered stable when three successive, discrete measurements were within the following criteria:

- Temperature, ± 1°C;
- pH, ± 0.1 pH unit, and
- Specific conductance, ± 5 percent.

Groundwater samples were collected into laboratory-supplied sample containers with preservative as appropriate. All samples were labeled with a unique identification code, placed in a hard-sided cooler with gel ice, and maintained at approximately 4 degrees Celsius.

Groundwater samples collected from MW-1R, MW-2, and MW-3R were analyzed for GRO and DRO, AK101 and AK102, respectively, and VOCs by USEPA Method 8260B. The samples from MW-1R (and its duplicate) and MW-3R were also analyzed for PAH SIMs by USEPA method 8270D. Samples were analyzed by SGS laboratory in Anchorage

3.7 SAMPLE HANDLING

Procedures used to maintain the integrity of soil and groundwater samples collected for laboratory analysis began at the time of collection and continued until analysis.

A bound field logbook, sample collection forms, and field logs were maintained to document the 2015 soil removal and sampling activities. Samples were assigned a unique identifier using project specific nomenclature. Field notes written in ink provided a record of information such as field staff, sample locations, field screening results, site observations, and work directives.

At the time of collection, sample containers appropriate for the specified analysis were filled and sealed. A blind sample designation was assigned to replicate samples and the collection time for these samples corresponded with the collection time of the primary sample. A trip blank was included in each cooler that contained samples to be analyzed for volatiles (i.e. GRO and BTEX). Labels indicating sample identification, date, time and the sampler's initials were affixed to the sample containers.

Chain of custody (COC) forms were completed as the samples were packaged into coolers for transport to the laboratory. Trip blanks, temperature blanks, and frozen gel ice packs were added to each cooler as required. The samples were maintained at a temperature of approximately 4 degrees Celsius (ºC) from the time of collection until arrival at the laboratory. Samples delivered by SLR personnel directly to SGS with sufficient time to allow for sample extraction within the holding time requirements of the test methods.

3.8 GROUNDWATER FLOW DIRECTION

All three wells were surveyed by Drake using an RTK global positioning system. Horizontal and vertical survey data was used in conjunction with water level depth data collected as part of groundwater sampling to calculate the groundwater elevation at each well. With these data the groundwater flow direction was calculated.

3.9 ADEC BUILDING SURVEY AND INDOOR AIR SAMPLING QUESTIONNAIRE

The SLR field staff completed an *ADEC Building Survey and Indoor Air Sampling Questionnaire* using visual observations and by interviewing AS staff at the site. A photoionization detector was used to collect indoor and outdoor measurements of total volatile hydrocarbons. *ADEC Building Survey and Indoor Air Sampling Questionnaire* is provided in Appendix C.

3.10 DECONTAMINATION AND WASTE MANAGEMENT

All samples were collected with either new or decontaminated sampling equipment. Approximately 10 gallons of development and purge water was generated. All water was contained in a drum and stored on site near the soil staging area. Soil cuttings generated during drilling were containerized in a super sack and staged near the soils from a prior project. The super sack with drilling cutting was uniquely labeled as SS1 Generated 10/1/15, to distinguish it from the other super sacks in the soil staging area (Photograph 10 of Appendix A). All disposable sampling material was disposed of as non-oily waste on site. No hazardous waste was generated during this project.

3.11 CALIBRATION PROCEDURES

Field instruments were calibrated according to manufacturer specifications prior to use and periodically during sampling if instrument drift is suspected. At a minimum, field instruments were calibrated daily during the field event. Documentation of calibration in provided in Appendix B.

3.12 HEALTH AND SAFETY

This work was performed in accordance with Alaska Airlines Health and Safety procedures and the SLR Corporate Health and Safety Plan. Alaska Airlines provided an escort for the SLR scientist and drilling crew to comply with Kotzebue Airport badging requirements.

4. RESULTS

This section provides a summary of field and analytical results.

4.1 GROUNDWATER SAMPLING

VOCs were detected in groundwater samples from wells MW-1R, MW-2, and MW-3R; however, with the exception of benzene, all VOC concentrations were below ADEC groundwater cleanup levels. Benzene concentrations of 0.0245 mg/L, 0.013 mg/L, and 0.0553 mg/L were reported at MW-1R, MW-2, and MW-3R, respectively, and exceeded the ADEC groundwater cleanup level of 0.005 mg/L.

GRO was detected in groundwater from all three borings, but only exceeded the ADEC groundwater cleanup level of 2.2 mg/L in MW-3R with a concentration of 3.1 mg/L.

DRO was detected in groundwater in all three wells sampled and exceeded the ADEC groundwater cleanup level of 1.5 mg/L at all locations with concentrations of 3.22 mg/L and 2.29 mg/L, and 11.1 mg/L in MW-1R, MW-2, and MW-3R, respectively. In monitoring well MW-2, the DRO concentration in the primary sample was below the cleanup level at 1.47 mg/L; however, the DRO concentration reported in the duplicate sample was 2.29 mg/L.

Groundwater samples for PAH analyses were collected from monitoring wells MW-1R and MW-3R. Although PAH concentrations were reported above the method limits of detection for a few PAHs, none exceeded the ADEC groundwater cleanup levels.

The 2015 groundwater analytical results and ADEC groundwater cleanup levels are provided in Table 1 and shown on Figure 2. Historical groundwater results for GRO, DRO, BTEX, and PAHs are provided in Table 2. The 2015 SGS analytical laboratory reports are provided in Appendix D.

4.2 WASTE CHARACTERIZATION SOIL SAMPLING

GRO and DRO concentration were detected above the method limit of detection in all three soil samples; however all concentrations were below the ADEC Method Two soil cleanup levels for the Arctic Zone and the migration to groundwater for the Under 40 inch Precipitation Zone.

Eight VOCs were reported at concentrations above the method limit of detection; however, no VOC concentration exceeded an ADEC Method Two soil cleanup level. Four VOCs, although “non-detect” had laboratory method limits of detection that exceeded the ADEC Method Two soil cleanup level for migration to groundwater in the Under 40 inch Precipitation Zone . All soil analytical results and ADEC Method Two soil cleanup levels are provided in Table 2 and laboratory reports are provided in Appendix D.

4.3 GROUNDWATER FLOW DIRECTION

Based on the most recent surveyed top of casing elevation, and the 2015 measured depth to groundwater, water table elevations were calculated at each well. Using the three groundwater elevation points, the groundwater flow direction beneath the AS facility was inferred to be to the northwest with gradient of 0.0015 feet/feet. Groundwater elevations and the inferred flow direction are shown on Figure 2.

4.4 ADEC BUILDING SURVEY AND INDOOR AIR SAMPLING QUESTIONNAIRE

An *ADEC Building Survey and Indoor Air Sampling Questionnaire* were completed and no indoor air contamination was detected. Potential sources were found in the garage area and included heavy equipment exhaust, drums containing used oil and glycol (drums were in good condition and sealed), and a fuel oil powered boiler; no sources were found in the terminal or office areas.

The garage area has good airflow with an operating ventilation system. Airflow through the garage area is also facilitated through the frequent opening and closing of large bay doors. A photoionization detector (PID) was used to determine the presence or absence of total volatile organic hydrocarbons in the terminal and office areas, and the garage. All PID readings were non-detect.

The building's foundation is a concrete slab on grade; there is no basement or crawl space. No significant cracks or breaks were observed in the building's foundation at the time of the survey. In addition, a new concrete floor, with underlying insulation, was installed in the garage area in September 2015.

The completed survey and questionnaire is provided in Appendix C.

4.5 QUALITY ASSURANCE AND QUALITY CONTROL

The analytical data were reviewed for consistency with the requirement of the Work Plan (SLR, 2015) and with *ADEC Technical Memorandum, Environmental Laboratory Data and Quality Assurance* (ADEC, 2009). The review was documented in the Data Quality Assessment (DQA) Review, which is provided in Appendix E. The DQA includes a list of all work order numbers for the project, a brief description of the type of samples analyzed, a Quality Assurance (QA) summary for the entire data set (except for waste characterization) and an ADEC Laboratory Data Review Checklist for each work order reviewed in the QA summary. The following data quality indicators were included in the review in order to evaluate the data against precision, accuracy, representativeness, completeness, and sensitivity requirements established for the project.

- COC paperwork and custody seals;
- Preservation (thermal 4 ± 2 ºC and chemical);
- Analytical method hold times;

- Blanks (trip blanks and method blanks);
- Continuous calibration verifications;
- Internal standards;
- Surrogate recoveries;
- Laboratory control sample and laboratory control sample duplicate (LCS/LCSD) recoveries as percent recovery and precision as relative percent difference (RPD);
- Matrix spike and matrix spike duplicate recoveries as percent recovery, and precision as RPD;
- Field replicates as RPD; and
- Laboratory method detection and reporting limits.

Anomalies identified are discussed in the DQA. Where applicable, the associated data was qualified by applying flags. The rationale for applying qualifiers to specific data sets is detailed in DQA Review. The data flags used are presented below:

Q - One or more laboratory quality control (QC) criteria (for example, LCS recovery or surrogate spike recovery) failed. Where applicable, an “H”, “L”, or “N” was appended to indicate positive, negative, or unknown bias, respectively.

J - Estimated: The analyte was positively identified but the result was outside the calibration range, between the limit of quantitation and the detection limit; the quantitation was an estimate.

M - The concentration was an estimate due to a sample matrix QC failure. Where applicable, an “H”, “L”, or “N” will be appended to indicate positive, negative, or unknown bias, respectively.

B - Blank contamination: The analyte was positively identified in the blank (e.g., trip blank and/or method blank) associated with the sample and the concentration reported for the sample was less than five times that of the blank (ten times for metals and common laboratory contaminants methylene chloride and acetone).

P - Sample preservation requirements were not satisfied.

The review indicated that the reported laboratory data met the data quality objectives. No data were rejected. A complete summary of the data review is provided in the DQA. Data qualifiers were added to the data tables and figures, where applicable.

5. DISCUSSION AND CONCLUSIONS

Two replacement monitoring wells MW-1R and MW-3R were installed by SLR field staff on September 30, 2015 and developed on October 1 2015. The two new wells and existing monitoring well MW-2 were sampled on October 1, 2015.

At MW-1R, the GRO, DRO, and benzene concentrations have decreased since 2000 relative to the historical results from lost monitoring well MW-1. At MW-3R, GRO and benzene concentrations have decreased since 2000 relative to the historical results from abandoned well MW-3; however, DRO concentrations appear to have increased. A similar trend was observed at MW-2.

GRO, DRO, and benzene concentrations reported between 2000 and 2015 at MW-1, MW-1R, MW-2, MW-3, and MW3R are summarized in the table below. All historical results (i.e., GRO, DRO, BTEX, and PAHs) are provided in Table 3.

mg/L	CLEANUP LEVEL	MW-1 (2000)	MW-1R (2015)	MW-2 (2000)	MW-2 (2002)	MW-2 (2010)	MW-2 (2015)	MW-3 (2000)	MW-3R (2015)
GRO	2.2	59	1.9	0.830	0.559	0.100	0.0923	6.2	3.1
DRO	1.5	6.6	3.22	0.240	1.01	6.70	2.29	3.3	11.1
Benzene	0.005	0.785	0.0245	0.036	0.0300	0.0234	0.013	0.180	0.0553

Groundwater flow directions were inferred to be northwest, west, and southwest in previous reports (Shannon and Wilson, 2014). In September 2015, the groundwater flow direction beneath the AS Terminal was inferred to be to the northwest. However, given the very low gradient calculated for during the 2015 event (0.0015 to the northwest), the transient nature of suprapermafrost groundwater, and the small number of historical data points, a “normal” flow direction is difficult to estimate.

Soil waste characterization analyses for DRO, GRO, VOCs, and PAHs showed that concentrations for all tested analytes were below the ADEC Method Two soil cleanup level for migration to groundwater. These results indicate that the source of the groundwater contamination is not in the immediate area of the wells tested and may be located offsite.

SLR field staff also completed an *ADEC Building Survey and Indoor Air Sampling Questionnaire.* Potential sources were detected, but they were only located in the garage area which is well ventilated. In addition, a PID was used to screen for the presence or absence of total volatile hydrocarbon in the building. All PID readings were non-detect.

An additional monitoring event is recommended for fall 2016 to better estimate concentration trends for GRO, DRO, and benzene, and the groundwater flow direction and gradients beneath the Site. Once additional data are collected, and concentration trends and groundwater flow directions are better understood, the scope of additional investigation needed to determine nature and extent of impacts can be accessed. The building’s foundation is a concrete slab on grade. No significant cracks or breaks were observed in the building’s foundation at the time of the survey.

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LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given site area. In performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an appropriate level of analysis for each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

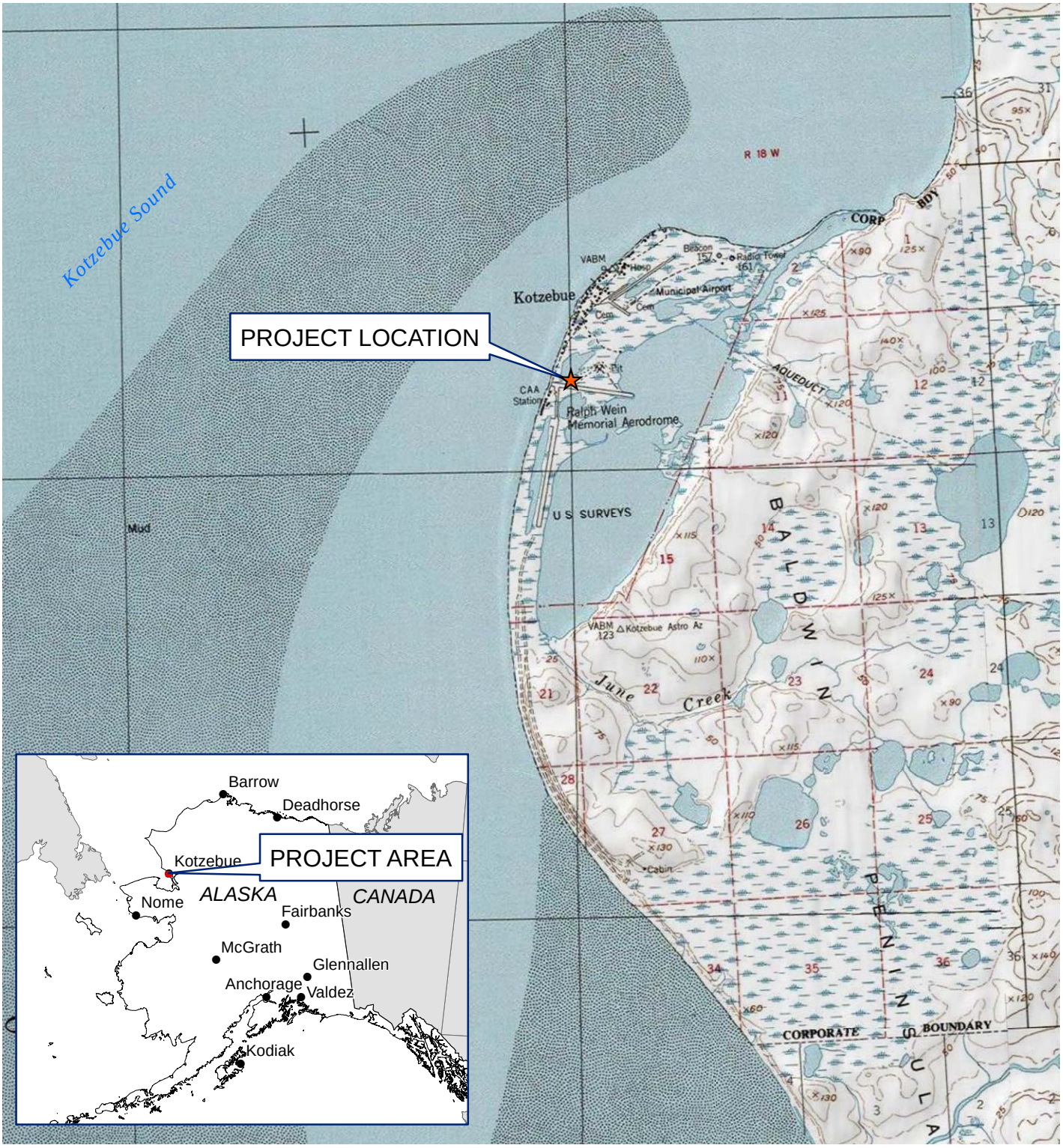
No investigation can be thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not therefore be construed as a guarantee of the absence of such materials on the site, but rather as the result of the services performed within the scope, practical limitations, and cost of the work performed.

Environmental conditions that are not apparent may exist at the site. Our professional opinions are based in part on interpretation of data from a limited number of discrete sampling locations and therefore may not be representative of the actual overall site environmental conditions.

The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the site, analysis of the data, and/or reevaluation of the findings, observations, and conclusions in the work product.

This work product presents professional opinions and findings of a scientific and technical nature. The work product shall not be construed to offer legal opinion or representations as to the requirements of, nor the compliance with, environmental laws rules, regulations, or policies of federal, state or local governmental agencies.

FIGURES



N

0 0.25 0.5 1 1.5 2 Miles

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY.
ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SLR

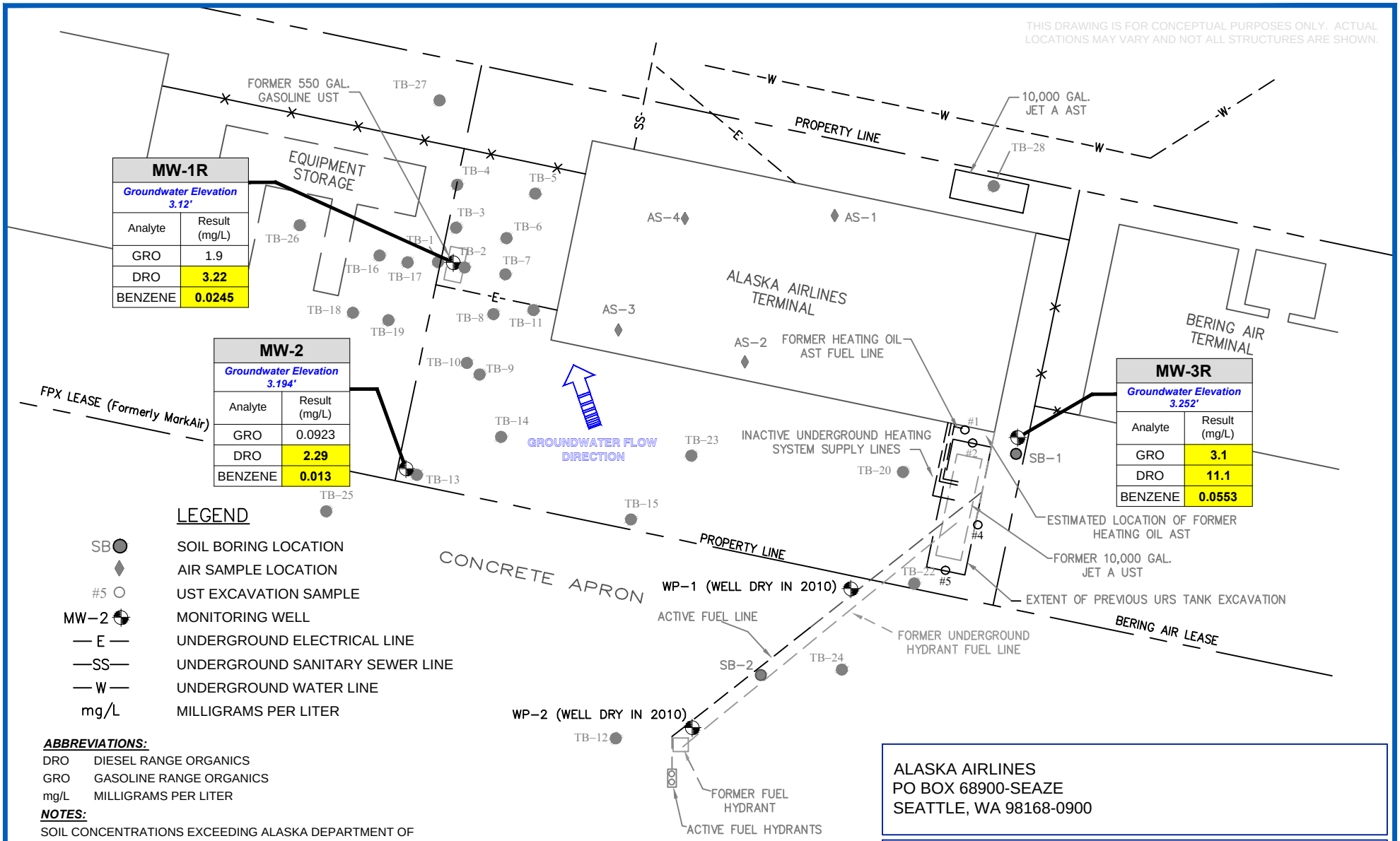
Client
ALASKA AIRLINES
PO BOX 68900
SEATTLE, WA 98168-0900

Report
ALASKA AIRLINES KOTZEBUE FACILITY
2015 GROUNDWATER MONITORING REPORT
RALPH WEIN MEMORIAL AIRPORT
KOTZEBUE, ALASKA

Drawing
SITE LOCATION MAP

Drawing	December 2015	Scale	1 in = 1 miles
File Name	F1 Kotzebue GW RPT_15.mxd	Project No.	105.00104.14001

Fig. No. 1


THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.
MW-1R
Groundwater Elevation 3.12'
Analyte | Result (mg/L)
GRO | 1.9
DRO | 3.22
BENZENE | 0.0245
MW-2
Groundwater Elevation 3.194'
Analyte | Result (mg/L)
GRO | 0.0923
DRO | 2.29
BENZENE | 0.013
MW-3R
Groundwater Elevation 3.252'
Analyte | Result (mg/L)
GRO | 3.1
DRO | 11.1
BENZENE | 0.0553
FORMER 550 GAL. GASOLINE UST
EQUIPMENT STORAGE
10,000 GAL. JET A AST
PROPERTY LINE
ALASKA AIRLINES TERMINAL
BERING AIR TERMINAL
FORMER HEATING OIL AST FUEL LINE
FPX LEASE (Formerly MarkAir)
GROUNDWATER FLOW DIRECTION
INACTIVE UNDERGROUND HEATING SYSTEM SUPPLY LINES
ESTIMATED LOCATION OF FORMER HEATING OIL AST
FORMER 10,000 GAL. JET A UST
EXTENT OF PREVIOUS URS TANK EXCAVATION
BERING AIR LEASE
CONCRETE APRON
WP-1 (WELL DRY IN 2010)
WP-2 (WELL DRY IN 2010)
ACTIVE FUEL LINE
FORMER UNDERGROUND HYDRANT FUEL LINE
FORMER FUEL HYDRANT
ACTIVE FUEL HYDRANTS
TB-1 TB-2 TB-3 TB-4 TB-5 TB-6 TB-7 TB-8 TB-9 TB-10 TB-11 TB-12 TB-13 TB-14 TB-15 TB-16 TB-17 TB-18 TB-19 TB-20 TB-22 TB-23 TB-24 TB-25 TB-26 TB-27 TB-28
AS-1 AS-2 AS-3 AS-4
SB-1 SB-2
#1 #2 #3 #4 #5
LEGEND
SB SOIL BORING LOCATION
AIR SAMPLE LOCATION
#5 UST EXCAVATION SAMPLE
MW-2 MONITORING WELL
E UNDERGROUND ELECTRICAL LINE
SS UNDERGROUND SANITARY SEWER LINE
W UNDERGROUND WATER LINE
mg/L MILLIGRAMS PER LITER
ABBREVIATIONS:
DRO DIESEL RANGE ORGANICS
GRO GASOLINE RANGE ORGANICS
mg/L MILLIGRAMS PER LITER
NOTES:
SOIL CONCENTRATIONS EXCEEDING ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION CLEANUP LEVELS FOR GROUNDWATER ARE HIGHLIGHTED IN YELLOW
SCALE: 1" = 40'
WHEN PLOTTED AT 8.5 X 11 PAGE SIZE
0 40' 80' 120'
N
SLR
ALASKA AIRLINES
PO BOX 68900-SEAZE
SEATTLE, WA 98168-0900
Report ALASKA AIRLINES KOTZEBUE FACILITY
2015 GROUND WATER MONITORING REPORT
RALPH WEIN MEMORIAL AIRPORT - KOTZEBUE, ALASKA
Drawing SITE DETAIL
Date December 2015
Scale 1" = 40'
Fig. No. 2
File Name F2 Kotzebue GW RPT_15
Project No. 105.00104.14001

TABLES

Table 1 - 2015 Groundwater Monitoring
Wein Memorial Airport, Kotzebue, Alaska

Compound in milligrams per liter (mg/L)	Screening Criteria	Sample Locations[2]										Trip Blanks			
	18 AAC 75, Table C Groundwater Cleanup Levels[1]	Primary: MW-1R 01-Oct-15 1155836001		Duplicate: MW-1R 01-Oct-15 1155836005		Primary: MW-2 01-Oct-15 1155836002		Duplicate: MW-2 01-Oct-15 1155836004		MW-3R 01-Oct-15 1155836003		GWTB-1 01-Oct-15 1155836006		GWTB-2 01-Oct-15 1155836007	
Fuels (AK101 and AK102)															
Gasoline Range Organics	2.2	1.9	=, M+	--	--	0.074	J	0.0923	J	**3.1**	=	[0.05]	ND	--	--
Diesel Range Organics	1.5	**3.22**	=	--	--	1.47	=, QN	**2.29**	**=, QN**	**11.1**	=	--	--	--	--
PAH SIMs (8270D, LV)															
1-Methylnaphthalene	0.15	0.00524	=	0.00468	=	--	--	--	--	0.000266	=	--	--	--	--
2-Methylnaphthalene	0.15	0.00628	=	0.00556	=	--	--	--	--	[0.000024]	ND	--	--	--	--
Acenaphthene	2.2	[0.000024]	ND, QN	0.000167	=, QN	--	--	--	--	0.000263	=	--	--	--	--
Acenaphthylene	2.2	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Anthracene	11	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Benzo(a)Anthracene	0.0012	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Benzo[a]pyrene	0.0002	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Benzo[b]Fluoranthene	0.0012	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Benzo[g,h,i]perylene	1.1	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Benzo[k]fluoranthene	0.012	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Chrysene	0.12	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Dibenzo[a,h]anthracene	0.00012	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Fluoranthene	1.5	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Fluorene	1.5	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Indeno[1,2,3-c,d] pyrene	0.0012	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Naphthalene	0.73	0.0315	=	0.0319	=	--	--	--	--	0.0017	=	--	--	--	--
Phenanthrene	11	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Pyrene	1.1	[0.000024]	ND	[0.000024]	ND	--	--	--	--	[0.000024]	ND	--	--	--	--
Volatile Organic Compounds (SW8260B)															
1,1,1,2-Tetrachloroethane	--	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
1,1,1-Trichloroethane	0.2	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,1,2,2-Tetrachloroethane	0.0043	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
1,1,2-Trichloroethane	0.005	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,1-Dichloroethane	7.3	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,1-Dichloroethene	0.007	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,1-Dichloropropene	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,2,3-Trichlorobenzene	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,2,3-Trichloropropane	0.00012	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,2,4-Trichlorobenzene	0.07	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,2,4-Trimethylbenzene	1.8	0.182	=	--	--	0.00061	J	0.00066	J	0.0347	=	--	--	[0.0005]	ND
1,2-Dibromo-3-chloropropane	--	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
1,2-Dibromoethane	0.00005	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,2-Dichlorobenzene	0.6	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,2-Dichloroethane	0.005	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
1,2-Dichloropropane	0.005	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,3,5-Trimethylbenzene	1.8	0.0592	=	--	--	[0.0005]	ND	0.00036	J	0.0225	=	--	--	[0.0005]	ND
1,3-Dichlorobenzene	3.3	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
1,3-Dichloropropane	--	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
1,4-Dichlorobenzene	0.075	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
2,2-Dichloropropane	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
2-Butanone (MEK)	22	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
2-Chlorotoluene	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
2-Hexanone	--	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
4-Chlorotoluene	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
4-Isopropyltoluene	--	0.0103	=	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
4-Methyl-2-pentanone (MIBK)	2.9	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
Benzene	0.005	**0.0245**	=	--	--	**0.013**	=	**0.0129**	=	**0.0553**	=	--	--	[0.0002]	ND
Bromobenzene	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Bromochloromethane	--	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Bromodichloromethane	0.014	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
Bromoform	0.11	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Bromomethane	0.051	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
Carbon disulfide	3.7	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
Carbon tetrachloride	0.005	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Chlorobenzene	0.1	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
Chloroethane	0.29	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND

Table 1 - 2015 Groundwater Monitoring
Wein Memorial Airport, Kotzebue, Alaska

Compound in milligrams per liter (mg/L)	Screening Criteria	Sample Locations[2]										Trip Blanks			
	18 AAC 75, Table C Groundwater Cleanup Levels[1]	Primary: MW-1R 01-Oct-15 1155836001		Duplicate: MW-1R 01-Oct-15 1155836005		Primary: MW-2 01-Oct-15 1155836002		Duplicate: MW-2 01-Oct-15 1155836004		MW-3R 01-Oct-15 1155836003		GWTB-1 01-Oct-15 1155836006		GWTB-2 01-Oct-15 1155836007	
Chloroform	0.14	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Chloromethane	0.066	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
cis-1,2-Dichloroethene	0.07	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
cis-1,3-Dichloropropene	0.0085	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
Dibromochloromethane	0.01	[0.0025]	ND	--	--	[0.00025]	ND	[0.00025]	ND	[0.0025]	ND	--	--	[0.00025]	ND
Dibromomethane	0.37	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Dichlorodifluoromethane	7.3	0.0084	J	--	--	0.021	=	0.0185	=	[0.005]	ND	--	--	[0.0005]	ND
Ethylbenzene	0.7	0.0688	=	--	--	0.00081	J	0.00078	J	0.245	=	--	--	[0.0005]	ND
Freon-113	1100	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
Hexachlorobutadiene	0.0073	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Isopropylbenzene (Cumene)	3.7	0.0164	=	--	--	[0.0005]	ND	[0.0005]	ND	0.0078	J	--	--	[0.0005]	ND
Methylene chloride	0.005	[0.025]	ND	--	--	[0.0025]	ND	[0.0025]	ND	[0.025]	ND	--	--	[0.0025]	ND
Methyl-t-butyl ether (MTBE)	0.47	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
Naphthalene	0.73	0.0468	J	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
n-Butylbenzene	0.37	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
n-Propylbenzene	0.37	0.0275	=	--	--	[0.0005]	ND	[0.0005]	ND	0.0059	J	--	--	[0.0005]	ND
o-Xylene	--	0.0516	=	--	--	[0.0005]	ND	[0.0005]	ND	0.135	=	--	--	[0.0005]	ND
P & M -Xylene	--	0.311	=	--	--	0.00096	J	0.00096	J	0.674	=	--	--	[0.001]	ND
sec-Butylbenzene	0.37	0.0055	J	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Styrene	0.1	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
tert-Butylbenzene	0.37	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Tetrachloroethene (PCE)	0.005	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Toluene	1.0	0.0032	J	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
trans-1,2-Dichloroethene	0.1	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
trans-1,3-Dichloropropene	0.0085	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Trichloroethene (TCE)	0.005	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Trichlorofluoromethane	11	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Vinyl acetate	37	[0.05]	ND	--	--	[0.005]	ND	[0.005]	ND	[0.05]	ND	--	--	[0.005]	ND
Vinyl chloride	0.002	[0.005]	ND	--	--	[0.0005]	ND	[0.0005]	ND	[0.005]	ND	--	--	[0.0005]	ND
Xylenes (total)[3]	10	0.363	=	--	--	0.00096	J	0.00096	J	0.809	=	--	--	[0.0015]	ND

Notes:
1 - This is the primary cleanup level for groundwater and corresponds to values listed in 18 AAC 75.345 Table C (ADEC, June 17, 2015).
2 - The field sample identification number, date collected and laboratory sample identification number are provided.
3 - Total values were the summation of detected compounds only. If compounds were not detected, then the highest LOD was listed.

Data Flags

ND	nondetect, LOD is presented in brackets to the left
J	reported value was between the laboratory DL and LOQ
Q	The quantitation was an estimate due to quality control failure. Where applicable, a "H", "L", or "N" was used to indicate possible high, low, or unknown bias.
M	The quantitation was an estimate due to matrix interference. Where applicable, a "+" or "-" was used to indicate possible high or low bias.
=	A detected compound [concentration listed in column to the left]

Abbreviations

--	Not applicable or screening criteria does not exist for this compound	LOQ	Limit of Quantitation
AAC	Alaska Administrative Code	LV	low volume
ADEC	Alaska Department of Environmental Conservation	mg/L	milligrams per liter
DL	Detection Limit	PAH	Polynuclear Aromatic Hydrocarbons
LOD	Limit of Detection	SIM	Selective Ion Monitoring

Bold and shaded - The value exceeds the primary screening criteria, 18 AAC 75 Table C.
Laboratory DL did not meet primary screening criteria limits, 18 AAC 75, Table C.

Table 2 - 2015 Soil Waste Characterization Sampling Results
Wein Memorial Airport, Kotzebue, Alaska

Compound in milligrams per kilogram (mg/Kg)	Screening Criteria		Sample Locations[3]						Trip Blank	
	18 AAC 75 Arctic Zone[1]	18 AAC 75 Migration to Groundwater[2]	093015MW1S 30-Sep-15 1155836008		093015MW3S 30-Sep-15 1155836009		100115SS1 01-Oct-15 1155836010		STB1 30-Sep-15 1155836011	
Fuels (AK101 and AK102)										
Gasoline Range Organics	1,400	300	5.39	=	189	=	41.4	=	[1.23]	ND
Diesel Range Organics	12,500	250	178	=	109	=	139	=		
Volatile Organic Compounds (SW8260B)										
1,1,1,2-Tetrachloroethane	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,1,1-Trichloroethane	360	0.82	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,1,2,2-Tetrachloroethane	8.1	0.017	[0.00665]	ND	[0.0114]	ND	[0.00925]	ND	[0.00615]	ND
1,1,2-Trichloroethane	17	0.018	[0.0053]	ND	[0.00915]	ND	[0.0074]	ND	[0.00492]	ND
1,1-Dichloroethane	900	25	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,1-Dichloroethene	1.3	0.03	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,1-Dichloropropene	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,2,3-Trichlorobenzene	--	--	[0.0266]	ND	[0.0458]	ND	[0.037]	ND	[0.0246]	ND
1,2,3-Trichloropropane	0.26	0.00053	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,2,4-Trichlorobenzene	41	0.85	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,2,4-Trimethylbenzene	49	23	0.232	=	1.05	=	0.433	=	[0.0246]	ND
1,2-Dibromo-3-chloropropane	--	--	[0.053]	ND	[0.0915]	ND	[0.074]	ND	[0.0493]	ND
1,2-Dibromoethane	0.89	0.00016	[0.0053]	ND	[0.00915]	ND	[0.0074]	ND	[0.00492]	ND
1,2-Dichlorobenzene	45	5.1	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,2-Dichloroethane	7.1	25	[0.0053]	ND	[0.00915]	ND	[0.0074]	ND	[0.00492]	ND
1,2-Dichloropropane	7.9	0.018	[0.0053]	ND	[0.00915]	ND	[0.0074]	ND	[0.00492]	ND
1,3,5-Trimethylbenzene	42	23	0.0865	=	0.628	=	0.208	=	[0.0123]	ND
1,3-Dichlorobenzene	69	28	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
1,3-Dichloropropane	--	--	[0.0053]	ND	[0.00915]	ND	[0.0074]	ND	[0.00492]	ND
1,4-Dichlorobenzene	44	0.64	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
2,2-Dichloropropane	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
2-Butanone (MEK)	23,300	59	[0.133]	ND	[0.229]	ND	[0.186]	ND	[0.123]	ND
2-Chlorotoluene	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
2-Hexanone	--	--	[0.133]	ND	[0.229]	ND	[0.186]	ND	[0.123]	ND
4-Chlorotoluene	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
4-Isopropyltoluene	--	--	0.0146	J	0.182	=	0.0311	J	[0.0123]	ND
4-Methyl-2-pentanone (MIBK)	2,100	8.1	[0.133]	ND	[0.229]	ND	[0.186]	ND	[0.123]	ND
Benzene	17	0.025	0.0239	=	0.0146	J	0.0115	J	[0.00615]	ND
Bromobenzene	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Bromochloromethane	--	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Bromodichloromethane	15	0.044	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Bromoform	430	0.34	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Bromomethane	21	0.16	[0.107]	ND	[0.183]	ND	[0.148]	ND	[0.0985]	ND
Carbon disulfide	250	12	[0.053]	ND	[0.0915]	ND	[0.074]	ND	[0.0493]	ND
Carbon tetrachloride	4.5	0.023	[0.00665]	ND	[0.0114]	ND	[0.00925]	ND	[0.00615]	ND
Chlorobenzene	200	0.63	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Chloroethane	34	580	[0.107]	ND	[0.183]	ND	[0.148]	ND	[0.0985]	ND
Chloroform	4.7	0.46	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Chloromethane	37	0.21	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
cis-1,2-Dichloroethene	190	0.24	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
cis-1,3-Dichloropropene	40	0.033	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Dibromochloromethane	21	0.032	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Dibromomethane	560	--	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Dichlorodifluoromethane	570	140	[0.0266]	ND	[0.0458]	ND	[0.037]	ND	[0.0246]	ND
Ethylbenzene	110	6.9	0.0726	=	2.1	=	0.53	=	[0.0123]	ND
Freon-113	750	750	[0.053]	ND	[0.0915]	ND	[0.074]	ND	[0.0493]	ND
Hexachlorobutadiene	3.8	0.12	[0.0266]	ND	[0.0458]	ND	[0.037]	ND	[0.0246]	ND
Isopropylbenzene (Cumene)	62	51	0.0157	J	0.0649	=	0.0326	J	[0.0123]	ND
Methylene chloride	240	0.016	[0.053]	ND	[0.0915]	ND	[0.074]	ND	[0.0493]	ND
Methyl-t-butyl ether (MTBE)	440	1.3	[0.053]	ND	[0.0915]	ND	[0.074]	ND	[0.0493]	ND
Naphthalene	42	20	0.191	=	0.213	=	0.161	=	[0.0246]	ND
n-Butylbenzene	42	15	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
n-Propylbenzene	42	15	0.0426	=	0.128	=	0.0663	=	[0.0123]	ND
o-Xylene	--	--	0.0577	=	1.25	=	0.305	=	[0.0123]	ND
P & M -Xylene	--	--	0.28	=	7.7	=	1.64	=	[0.0246]	ND
sec-Butylbenzene	41	12	0.013	J	0.0302	J	0.02	J	[0.0123]	ND
Styrene	200	0.96	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
tert-Butylbenzene	70	12	[0.0133]	ND	0.0723	=	0.0252	J	[0.0123]	ND
Tetrachloroethene (PCE)	15	0.024	[0.00665]	ND	[0.0114]	ND	[0.00925]	ND	[0.00615]	ND
Toluene	220	6.5	0.0513	=	0.038	J	0.0141	J	[0.0123]	ND
trans-1,2-Dichloroethene	240	0.37	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
trans-1,3-Dichloropropene	40	0.033	[0.0133]	ND	[0.0229]	ND	[0.0186]	ND	[0.0123]	ND
Trichloroethene (TCE)	0.85	0.02	[0.00665]	ND	[0.0114]	ND	[0.00925]	ND	[0.00615]	ND
Trichlorofluoromethane	990	86	[0.0266]	ND	[0.0458]	ND	[0.037]	ND	[0.0246]	ND
Vinyl acetate	2,200	100	[0.053]	ND	[0.0915]	ND	[0.074]	ND	[0.0493]	ND
Vinyl chloride	6.4	0.0085	[0.0053]	ND	[0.00915]	ND	[0.0074]	ND	[0.00492]	ND
Xylenes (total)	63	63	0.338	=	8.95	=	1.94	=	[0.0246]	ND
Percent Solids (SM21 2540G)										
Total Solids	--	--	89.4	=	89.2	=	86.8	=	--	--

Table 2 - 2015 Soil Waste Characterization Sampling Results
Wein Memorial Airport, Kotzebue, Alaska

Compound in milligrams per kilogram (mg/Kg)	Screening Criteria		Sample Locations[3]			Trip Blank
	18 AAC 75 Arctic Zone[1]	18 AAC 75 Migration to Groundwater[2]	093015MW1S 30-Sep-15 1155836008	093015MW3S 30-Sep-15 1155836009	100115SS1 01-Oct-15 1155836010	STB1 30-Sep-15 1155836011

Notes:

1 - The cleanup level corresponds to the most stringent of direct contact or inhalation of soil as listed in 18 AAC 75.341, Tables B1 and B2, Method Two cleanup levels for the Arctic Zone (ADEC, June 17, 2015).

2 - The cleanup level corresponds to Migration to Groundwater as listed in 18 AAC 75.341, Tables B1 and B2, Method Two cleanup levels for Under 40 Inch Zone (ADEC, June 17, 2015).

3 - The field sample identification number, date collected, and laboratory sample identification number are provided.

4 - Total values were the summation of detected compounds only. If compounds were not detected, then the highest LOD was listed.

Data Flags

ND	Nondetect, LOD is presented in brackets to the left
J	The analyte was positively identified, but the result was between the LOQ and DL; the quantitation was an estimate.
=	A detected compound [concentration listed in column to the left]

Abbreviations

--	Not applicable or screening criteria does not exixt for this compou	LOD	Limit of Detection
AAC	Alaska Administrative Code	LOQ	Limit of Quantitation
ADEC	Alaska Department of Environmental Conservation	mg/Kg	milligrams per kilogram
DL	Detection Limit		

Laboratory DL did not meet primary screening criteria limits, 18 AAC 75, Table B1 , Arctic Zone or Migration to Groundwater.

Table 3 - Historical Groundwater Results
Wein Memorial Airport, Kotzebue, Alaska

Sample Location	Sample Date	AK101	AK102	BTEX USEPA Method 8021B				PAHs USEPA Method 8270D[B]					
		Gasoline Range Organics	Diesel Range Organics	Benzene	Toluene	Ethylbenzene	Xylenes	Phenanthrene	Pyrene	Chrysene	Naphthalene	1-Methylnaphthlene	2-Methylnaphthlene
ADEC Ground Water Cleanup Levels[A]		**2.2**	**1.5**	**0.005**	**1.0**	**0.7**	**10**	**11**	**1.1**	**0.12**	**0.73**	**0.15**	**0.15**
MW-1*	7/22/2000	**59**	**6.6**	**0.785**	**3**	**1.55**	**14.5**	--	--	--	--	--	--
MW-2	7/22/2000	0.830	0.240	**0.036**	0.0014	0.017	0.01	--	--	--	--	--	--
MW-3	7/22/2000	**6.2**	**3.3**	**0.180**	0.032	0.2	1.2	--	--	--	--	--	--
MW-2	9/13/2002	0.559	1.01	**0.0300**	0.00136	0.00814	0.00815	--	--	--	--	--	--
Duplicate of MW-2	9/13/2002	0.605	0.381	**0.0331**	0.00160	0.00901	0.00895	--	--	--	--	--	--
WP-1	9/13/2002	0.228	0.223	**0.0115**	<0.0005	<0.0005	0.00163	--	--	--	--	--	--
WP-2	9/13/2002	0.0526	**1,990**	0.0017	<0.0005	0.00067	0.00513	--	--	--	--	--	--
MW-2	10/7/2010	0.100	**6.70** H	**0.0234**	0.000810 J	0.00137 J	0.00162 J	0.0000896	0.000205	0.000182	0.000115	0.0000742	0.0000693
Duplicate of MW-2	10/7/2010	0.0910 J	**11.8** H	**0.0215**	ND	0.00115 J	0.00113 J	0.0000630 J	0.000155	0.000149	0.0000954 J	0.0000534	0.0000504 J
MW-1R	10/1/2015	1.9	**3.22**	**0.0245**	0.0032 J	0.0688	0.363	ND	ND	ND	0.315	0.00524	0.00628
MW-2	10/1/2015	0.074	1.47	**0.013**	ND	0.00081 J	0.00096 J	--	--	--	--	--	--
Duplicate of MW-2	10/1/2015	0.0923	**2.29**	**0.0129**	ND	0.00078 J	0.00096 J	--	--	--	--	--	--
MW-3R	10/1/2015	**3.1**	**11.1**	**0.0553**	ND	0.245	0.809	ND	ND	ND	0.0017	0.000266	ND

Notes:

[A] ADEC Cleanup Levels (18 AAC 70) as revised on June 7, 2015.

[B] PAHs not presented in this table were not detected in ground water samples

[*] Duplicate samples were averaged

All units in mg/L

Abbreviations:

-- - not analyzed

< - less than

BTEX - benzene, toluene, ethylbenzene, and xylenes

H - Result is biased high due to heavier hydrocarbons contributing to middle distillate range.

J - estimated value

mg/L - milligrams per liter

N/A - not applicable

ND - not detected at or above [Limit of Quantitation]

PAH - polynuclear aromatic hydrocarbons

USEPA - Environmental Protection Agency

APPENDIX A

PHOTOGRAPH LOG

ALASKA AIRLINES
Alaska Airlines, Inc
PO Box 68900-SEAZE
Seattle, WA 98168-0900

December 2015

Photograph Log
2015 Kotzebue Airport Groundwater Monitoring

Photograph 1:
Damaged and unrepairable well MW-3, about the be decommissioned. Mangled surface vault has been removed and is visible at photo center. (Sep 30, 2015).

Photograph 2:
Decommissioned well MW-3. Bentonite is visible in photo. Clean gravel was filled over bentonite to match surface grade. (Sep 30, 2015).

Photograph Log
2015 Kotzebue Airport Groundwater Monitoring

Photograph 3:
Photo shows auger mounted on loader drilling MW-3R. Southeast corner of Alaska Airlines terminal building is visible on the left. (Sep 30, 2015).

Photograph 4:
Larger truck-mounted auger drill rig at MW-3R. (Sep 30, 2015).

Photograph Log
2015 Kotzebue Airport Groundwater Monitoring

Photograph 5:
Installing monitoring well in boring MW-3R. Bentonite well seal is visible. (Sep 30, 2015).

Photograph 6:
Large truck-mounted auger drill rig drilling MW-1R. Photo faces southwest, away from Alaska Airlines terminal building. (Sep 30, 2015).

Photograph 7:
Completed monitoring well MW-1R with flush mounted vault. Photo faces north. (Oct 1, 2015).

Photograph 8:
Repairing the surface vault at MW-2. (Oct 1, 2015).

Photograph Log
2015 Kotzebue Airport Groundwater Monitoring

Photograph 9:
Measuring groundwater level at MW-2 prior to collecting analytical sample. (Oct 1, 2015).

Photograph 10:
All cuttings generated during drilling were containerized in a super sack and staged as pictured here. (Oct 1, 2015).

APPENDIX B

FIELD FORMS AND FIELD NOTES

ALASKA AIRLINES
Alaska Airlines, Inc
PO Box 68900-SEAZE
Seattle, WA 98168-0900

December 2015

Soil Sampling Form

Client/Site Name: Alaska Air / Kotzebue Airport Project #: 185.00104.14001

093015 MW3S

Sample ID: ~~093015 MW3S~~ BD	**Location/Area:** MW-3R borehole
Sampled By: Ben Siwiec	Sample Time: 1220 Sample Date: 9/30/15
Approx. Air Temperature (°F): 34	Duplicate ID:
Weather Conditions: Partly Cloudy, Snow Showers	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Location Information

☐ Surface ☒ Boring ☐ Test Pit (floor / sidewall) ☐ Excavation Sample Depth (ft bgs): 3-6 ft

Water level Depth (ft bgs) ~4-5 ft Frozen Soil Depth (ft bgs) 6-7 ft

Note- If not known at sample location, list as not determined "ND"

Sample Description

GRAVEL (3 – 0.08 IN)	SAND (0.08 – 0.003 IN)	SILT (< 0.003 IN)	CLAY (NO GRAINS VISIBLE)
GW (GP) GM GC	SW SP SM SC	ML	CL OL MH CH OH

Color Brown %Coarse 90 %Fines 10 Peat/Organic Soil Likely Present (Y/N) N

Moisture (circle one): Dry, (Moist), Wet/Saturated **Stained:** Y or (N) **Odor** (describe nature and intensity) Hydrocarbon

PID 1076 ppm ☒ Headspace ☐ In-Sampler ☐ In-Situ **PID/FID Model/SN:** (IF USED) MiniRAE 3000

Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable
VOCs	X	(DRO)/RRO	X	RCRA Metal			
BTEX		PAHs		Lead (only)			
GRO	X	PCBs					

Collection Method Spoon

Notes/Comments (indicate general location, and possible other relevant conditions not listed above):

Collected from auger flight and cuttings.

Sample ID: 093015 MW1S	**Location/Area:** MW-1R borehole
Sampled By: Ben Siwiec	Sample Time: 1530 Sample Date: 9/30/15
Approx. Air Temperature (°F): 34	Duplicate ID:
Weather Conditions: Ptly Cloudy, Snow Showers	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Location Information

☐ Surface ☒ Boring ☐ Test Pit (floor / sidewall) ☐ Excavation Sample Depth (ft bgs): 1-5

Water level Depth (ft bgs) 3-4 Frozen Soil Depth (ft bgs) ~5-6

Note- If not known at sample location, list as not determined "ND"

Sample Description

GRAVEL (3 – 0.08 IN)	SAND (0.08 – 0.003 IN)	SILT (< 0.003 IN)	CLAY (NO GRAINS VISIBLE)
GW (GP) GM GC	SW SP SM SC	ML	CL OL MH CH OH

Color Brown %Coarse 90 %Fines 10 Peat/Organic Soil Likely Present (Y/N) N

Moisture (circle one): Dry, (Moist), Wet/Saturated **Stained:** Y or (N) **Odor** (describe nature and intensity) None

PID 15.0 ppm ☒ Headspace ☐ In-Sampler ☐ In-Situ **PID/FID Model/SN:** (IF USED) MiniRAE 3000

Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable
VOCs	X	(DRO)/RRO	X	RCRA Metal			
BTEX		PAHs		Lead (only)			
GRO	X	PCBs					

Collection Method Spoon

Notes/Comments (indicate general location, and possible other relevant conditions not listed above):

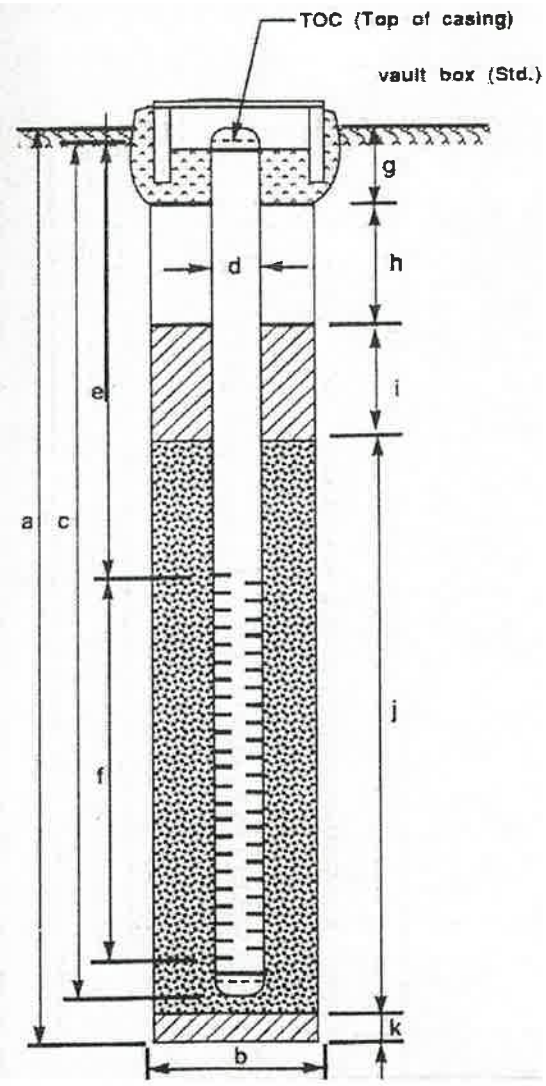
Collected from cuttings off ground.

SLR

FLUSH MOUNTED WELL DETAILS

PROJECT NUMBER 105.00104.14001
PROJECT NAME Kotzebue Airport
BORING/WELL# MW 1R
INSTALLATION DATE 9/30/15
WELL OWNER (1) Alaska Airlines
WELL COMPLETION METHOD (2) _____
SITE NAME: Kotzebue airport

TOP OF CASING ELEV: _____
GROUND SURFACE ELEV: _____
NORTH COORD (3) _____
EAST COORD (3) _____
GEOHYDROLOGIC ZONE (4) _____
WELL TYPE (5) _____
SOLE SOURCE AQUIFER (6) _____



EXPLORATORY BORING

a. Borehole depth 5.7 ft.
b. Borehole diameter 12 in.
Drilling method Auger drill rig

WELL CONSTRUCTION

c. Screen and casing riser length 5.2 ft.
Material PVC
d. Inside diameter 2 in.
e. Depth to top of screen 0.2 ft. BTOC
f. Screen length 5 ft.
Perforated interval from 0.2 to 5.2 ft. BTOC
Perforation type Slot 5
Perforation size 0.010 in.
Percent open area — %
g. Surface seal — ft. bgs
Seal material —
h. Backfill 0.5 ft.
Backfill material Gravel fill
i. Seal 1 ft.
Seal material bentonite chips
j. Filter pack (length) 4.2 ft.
Pack material 10/20 Silica sand
k. Bottom seal — ft.
Seal material —

Form prepared by Ben Siwiec
Date 9/30/15

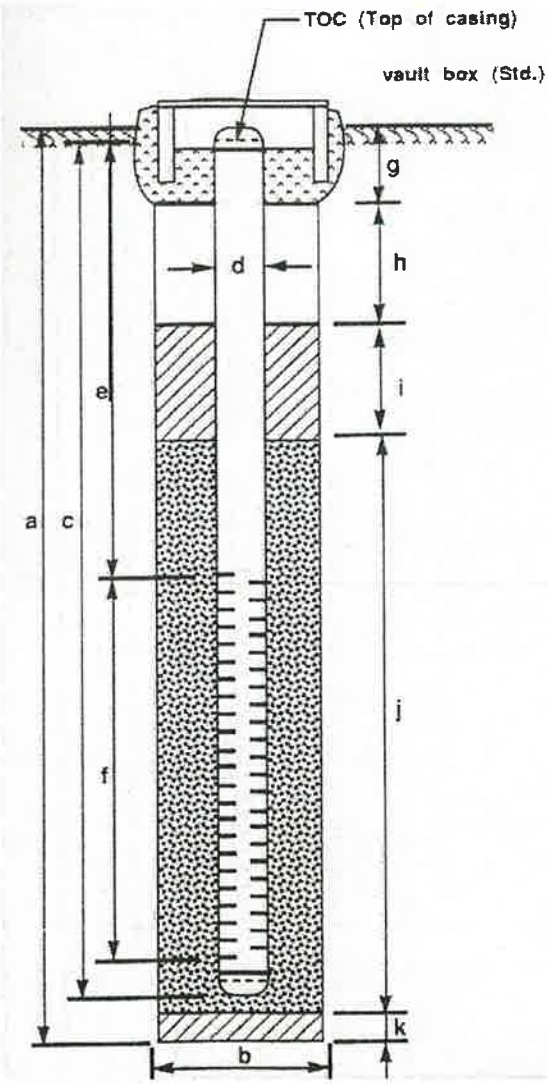
Remarks: 2 bags (100 lbs) 10/20 Silica sand
1 bag bentonite chips (50 lbs)
TOC is 0.3 ft below top of monument and 0.5 ft below grade

SLR

FLUSH MOUNTED WELL DETAILS

PROJECT NUMBER 105.00104.14001
PROJECT NAME Kotzebue Airport
BORING/WELL# MW 3R
INSTALLATION DATE 9/30/15
WELL OWNER (1) Alaska Airlines
WELL COMPLETION METHOD (2) _____
SITE NAME: Kotzebue airport

TOP OF CASING ELEV: _____
GROUND SURFACE ELEV: _____
NORTH COORD (3) _____
EAST COORD (3) _____
GEOHYDROLOGIC ZONE (4) _____
WELL TYPE (5) _____
SOLE SOURCE AQUIFER (6) _____



EXPLORATORY BORING

a. Borehole depth ~~5.5~~ BB 6 ft.
b. Borehole diameter 12 in.
Drilling method Auger drill rig

WELL CONSTRUCTION

c. Screen and casing riser length 5.5 ft.
Material PVC
d. Inside diameter 2 in.
e. Depth to top of screen 0.4 ft. BTOC
f. Screen length 5 ft.
Perforated interval from 0.4 to 5.4 ft. BTOC
Perforation type PVC Slots
Perforation size 0.010 in.
Percent open area — %
g. Surface seal — ft. bgs
Seal material —
h. Backfill 0.5 ft.
Backfill material Gravel fill
i. Seal 1 ft.
Seal material bentonite chips
j. Filter pack (length) 4.5 ft.
Pack material 10/20 silica sand
k. Bottom seal — ft.
Seal material —

Form prepared by Ben Siwiec
Date 9/30/15

Remarks: 2 bags (100 lbs) 10/20 Silica sand
0.75 bags bentonite chips (35-40 lbs)

SLR

Well Development Form

Site / Client Name: Alaska Air Kotzebue Airport	**Well ID:** MW1R
Project #: 105.00104.14001	Developed By: Ben Squire
Date (mm/dd/yy): 10/1/15	

Well Information

Well Installation Date (mm/dd/yy): 9/30/15	Filter Pack: ☒ Poured Sand; ☒ Pre-Packed; ☐ Natural (BOTH)
Date Last Developed (mm/dd/yy): N/A	Filter Pack (top to bottom)(ft bgs): 1.5 to 5.7
Wellbore Diameter (in): 12	Well Sounding Depth: 5.09 BTOC
Well Diameter (in): 2	Measured Depth to Water (ft. bgs): 2.84 BTOC
Well Depth Upon Completion (ft. bgs): 5.09 BTOC	Water Column Thickness in Well (ft): 2.2
Screen (top to bottom)(ft bgs): 3.2 to 5.2 BTOC	Time of Gauging: 1220

Development Method and Equipment

☐ Mechanical Surging ☐ Over-Pumping	Drill Rig Used (y/n): No Rig type:
☒ Surging/Pumping ☐ High Pressure Jetting	Pump Type/Capacity (gpm): —
☐ Other (describe): Using Waterra valve and block by hand	Depth of Pump or Airlift Line (ft bgs): 5
	Surge Block Length/Type: Waterra 2"

Purge Volume Calculations (if required)

(a) Volume of Water in Filter Pack = Saturated Thickness of Filter Pack x Table 1 Value (gal) :

(b) Volume of Water in Well Casing = Height of Water Column x Table 2 Value (gal) :

(c) Minimum Purge Volume = [(a) + (b)] x Number of Desired Casing Volumes (gal):

Surging Information

Surge Interval (ft bgs)	Surge Start Time	Surge Finish Time
1225 to 4.85	end 1230	Maybe 1 pint, well dry.
to		
to		

Purging and Water Quality Parameters

Time	Purge Volume (gal)	Temp (°C)	Specific Conductance (µS/cm°)	DO (mg/L)	ORP (mV)	pH	Turbidity (NTU) and/or Color	Measured Depth to Water (ft BTOC)	Total Drawdown (ft)	Sediment in Discharge Water (y/n)
Surged for 5 minutes by hand until well purged dry. Well allowed to recharge and re-purged multiple times. A total of 1.75 gallons was purged during development. Water was brown, highly turbid (silty).										

Fluids added during development (y/n) (type/volume): —

IDW Management (container type and date sealed, treatment, disposal):

Notes: Flush mounted. TOC is 0.3 ft below ~~grade~~ top of monument. TOC is 0.5 ft below grade.

Table 1 – Volume of Water in Filter Pack per Foot (30% porosity assumed)

Well Diameter (in)	Borehole Diameter (in)				
	2	4	6	8	10
1	0.037	0.184	0.428	0.771	1.212
2	-	0.147	0.392	0.734	1.175
4	-	-	0.245	0.587	1.028

Table 2 – Volume of Water in Well per Foot

Well Diameter (in)	Volume of Water per Foot (gal)
1	0.41
2	0.163
4	0.653

SLR

Well Development Form

Site / Client Name: Alaska Air Kotzebue Airport	**Well ID:** MW3R
Project #: 105.00104.14001	Developed By: Ben Siwiec
Date (mm/dd/yy): 10/1/15	

Well Information

Well Installation Date (mm/dd/yy): ~~10~~ 9/30/15	Filter Pack: ☒ Poured Sand; ☒ Pre-Packed; ☐ Natural — Both
Date Last Developed (mm/dd/yy): —	Filter Pack (top to bottom)(ft bgs): 1.5 to 6
Wellbore Diameter (in): 12	Well Sounding Depth: 5.4
Well Diameter (in): 2	Measured Depth to Water (ft. ~~bgs~~): 3.36 BTOC
Well Depth Upon Completion (ft. ~~bgs~~): 5.4 BTOC	Water Column Thickness in Well (ft): 2.04
Screen (top to bottom)(ft ~~bgs~~): 0.4 to 5.4 BTOC	Time of Gauging: 1710

Development Method and Equipment

☐ Mechanical Surging ☐ Over-Pumping	Drill Rig Used (y/n): NO Rig type:
☒ Surging/Pumping ☐ High Pressure Jetting	Pump Type/Capacity (gpm): —
☐ Other (describe): Using Waterra valve and surge block by hand.	Depth of Pump or Airlift Line (ft bgs): 5.5
	Surge Block Length/Type: Waterra 2"

Purge Volume Calculations (if required)

(a) Volume of Water in Filter Pack = Saturated Thickness of Filter Pack x Table 1 Value (gal) :

(b) Volume of Water in Well Casing = Height of Water Column x Table 2 Value (gal) :

(c) Minimum Purge Volume = [(a) + (b)] x Number of Desired Casing Volumes (gal):

Surging Information

Surge Interval (ft ~~bgs~~)	Surge Start Time	Surge Finish Time
5 to 5.4 BTOC	1445	1450
to		
to		

Purging and Water Quality Parameters

Time	Purge Volume (gal)	Temp (°C)	Specific Conductance (µS/cm°)	DO (mg/L)	ORP (mV)	pH	Turbidity (NTU) and/or Color	Measured Depth to Water (ft BTOC)	Total Drawdown (ft)	Sediment in Discharge Water (y/n)
Surged for 5 minutes by hand until well purged dry. Well allowed to recharge and re-purged twice. A total of 1.1 gallons was purged during development. Water was brown, highly turbid (silty).										

Fluids added during development (y/n) (type/volume): —

IDW Management (container type and date sealed, treatment, disposal):

Notes:

Table 1 – Volume of Water in Filter Pack per Foot (30% porosity assumed)

Well Diameter (in)	Borehole Diameter (in)				
	2	4	6	8	10
1	0.037	0.184	0.428	0.771	1.212
2	-	0.147	0.392	0.734	1.175
4	-	-	0.245	0.587	1.028

Table 2 – Volume of Water in Well per Foot

Well Diameter (in)	Volume of Water per Foot (gal)
1	0.41
2	0.163
4	0.653

SLR

Groundwater Sampling Form

Site/Client Name: Alaska Air Kotzebue Airport	**Well ID:** MW 1R
Project # : 105.00104.1400	Sample ID: 100115 MW1R
Sampled By: Ben Siwik	Sample Time: ~~1422~~ 1622 Sample Date: 10/1/15
Weather Conditions: Cloudy Windy 35°	Duplicate ID: 100115 MW5
Sampling Method: ☒ Low Flow ☐ Other	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Well Information

Well Type: ☒ Permanent ☐ Temporary	Well Diameter 2 in.	Screen Interval: 0.6 ft BGS to 5.6 ft BGS
Well Condition: ☒ Good ☐ Fair ☐ Poor (if fair or poor explain in Notes)		Stickup ☐ Yes ☒ No; If yes, −0.5 ft above ground

Gauging/Purging Information

Depth to Water (ft BTOC): 2.89	Tubing/Pump Depth (ft. BTOC): 4.5
Total Depth (ft BTOC): 5.09	Purge Start Time (24-hr) ~~1334~~ 1534
Depth to Product (ft. BTOC) NA	Purge End Time (24-hr) 1421
Product Thickness (ft) NA	Total Purge Time (min) 47

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.;

Min. purge volume if required: purge volume (gal) = volume of water/ft_____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4' – 0.653 gal/ft	6' – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameter for 3 consecutive reading [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate (gal/minute)	Purge Volume (gal)	Temp (°C)	Specific Conductance (µS/cm°)	DO (mg/L)	ORP (mV)	pH	Turbidity (NTU)	DTW (ft BTOC)	Drawdown (ft)
			(± 3 %)	(± 3%)	(± 10%)	(± 10mV)	(± 0.1)	(± 10%)		(Max____ft)
1534	0.4		2.09	1.734	2.61	4.3	8.87	27.9	3.05	0.16
1535	0.4	1.1	2.13	1.238	0.85	4.2	8.94	14.6	3.06	0.17
1536	0.4		2.14	1.236	0.62	-17.1	9.21	11.7	3.07	0.18
~~1440~~ 1601	0.4		2.14	1.233	0.60	-30.1	9.38	7.02	3.08	0.19
~~1446~~ 1606	0.4	2.8	2.13	1.231	0.58	-37.2	9.31	4.40	3.08	0.19
~~1447~~ 1611	0.4		2.12	1.228	0.45	-32.0	9.23	—	3.08	0.19
~~1446~~ 1616	0.4	3.7	2.12	1.225	0.45	-26.6	9.16	—	3.08	0.19
~~1421~~ 1621	0.4	4.2	2.11	1.223	0.46	-34.4	9.25	—	3.08	0.19

Sample Color: Clear **Sample Odor:** Gasoline smell **Sheen:** yes

Analytical Sampling

Analyses	Number/Type of Bottle	Preservative/ Comments	Analyses	Number/Type of Bottle	Preservative/ Comments
GRO/BTEX AK101	2x 250ml	HCl	Total Metals		
DRO AK102	3x 40 ml	HCl	Dissolved Metals		
RRO					
VOCs 8260B	3x 40 ml	HCl			
SVOCs					
PAHs 8270B	2x 250 ml	None			~~1611~~

Notes: Duplicate is for PAHs only. DRO, GRO, VOCs not duplicated here

Turbidimeter malfunctioned at ~~1411~~, will require repair.

Equipment: Pump Type Peristaltic Tubing (Type/Length) Teflon-lined Bailer Type —

Water Level Meter 100-ft Multi-Parameter Meter (Make/SN#) YSI 556

Turbidity Meter (Make/SN#) LaMotte 2020e Filter Lot # —

IDW Disposal: ☐ Discharged to surface ☐ Treated (how?)_____ ☒ Other: collected in drum

SLR

Groundwater Sampling Form

Site/Client Name: Alaska Airlines Kotzebue Airport	**Well ID:** MW2
Project #: 105.00104.14001	Sample ID: 100115MW2
Sampled By: Ben Siwiec	Sample Time: 1400 Sample Date: 10/1/15
Weather Conditions: Cloudy	Duplicate ID: 100115MW4
Sampling Method: ☒ Low Flow ☐ Other_____	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Well Information

Well Type: ☒ Permanent ☐ Temporary	Well Diameter 2 in.	Screen Interval: _____ ft BGS to _____ ft BGS
Well Condition: ☐ Good ☐ Fair ☐ Poor (if fair or poor explain in Notes)		Stickup ☐ Yes ☒ No; If yes, -0.35 ft above ground

Gauging/Purging Information

Depth to Water (ft BTOC): 2.76	Tubing/Pump Depth (ft. BTOC): 6
Total Depth (ft BTOC): 7.05	Purge Start Time (24-hr) 1314
Depth to Product (ft. BTOC) NA	Purge End Time (24-hr) 1359
Product Thickness (ft) NA	Total Purge Time (min) 45

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.;

Min. purge volume if required: purge volume (gal) = volume of water/ft_____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4' – 0.653 gal/ft	6' – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameter for 3 consecutive reading [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate (gal/minute)	Purge Volume (gal)	Temp (°C) (± 3 %)	Specific Conductance (µS/cm°) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max____ft)
1317	0.35							Hi-gray	3.08	0.32
1322	0.35							Hi-gray	3.07	0.31
1325	0.35							17.4		
1339	0.35	2.0	1.17	1.063	0.39	65.4	8.01	32.6	3.09	0.33
1344	0.35	~~2.0~~ 3.8	1.15	1.144	1.05	58.9	8.10	25.4	3.09	0.33
1349	0.35		1.15	1.219	1.00	51.0	8.19	28.9	3.09	0.33
1354	0.35	3.2	1.13	1.276	0.91	47.7	8.24	25.7	3.09	0.33
1359	0.35		1.13	1.322	0.79	37.0	8.26	30.9	3.09	0.33
	total	3.8								

Sample Color: yellow-clear **Sample Odor:** Can't tell **Sheen:** Yes

Analytical Sampling

Analyses	Number/Type of Bottle	Preservative/ Comments	Analyses	Number/Type of Bottle	Preservative/ Comments
(GRO)/BTEX Akl01	3 x 40ml	HCl	Total Metals		
(DRO) Akl02 ~~8270D~~	2 x 250ml	HCl	Dissolved Metals		
RRO					
(VOCs) 8260B	3x40ml	HCl			
SVOCs					
PAHs					

Notes: MW2 Monument replaced. TOC lowered. TOC is 0.24 ft below top of monument and about 0.35 ft below ground.

Equipment: Pump Type Peristaltic Tubing (Type/Length) Teflon-lined Bailer Type —

Water Level Meter 100-ft Multi-Parameter Meter (Make/SN#) YSI 556

Turbidity Meter (Make/SN#) LaMotte 2020e Filter Lot # —

IDW Disposal: ☐ Discharged to surface ☐ Treated (how?)_____ ☒ Other: Collected in drum

SLR

Groundwater Sampling Form

Site/Client Name: Alaska Air Kotzebue Airport	**Well ID:** MW3R
Project #: 105.00104.14001	Sample ID: 100115MW3R
Sampled By: Ben Siwiec	Sample Time: 1755 Sample Date: 10/1/15
Weather Conditions: Cloudy, windy 32°	Duplicate ID: —
Sampling Method: ☒ Low Flow ☐ Other_____	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Well Information

Well Type: ☒ Permanent ☐ Temporary	Well Diameter 2 in.	Screen Interval: 0.9 ft BGS to 5.9 ft BGS
Well Condition: ☒ Good ☐ Fair ☐ Poor (if fair or poor explain in Notes)		Stickup ☐ Yes ☒ No; If yes, _____ ft above ground

Gauging/Purging Information

Depth to Water (ft BTOC): 3.36	Tubing/Pump Depth (ft. BTOC): 5.3
Total Depth (ft BTOC): 5.40	Purge Start Time (24-hr) 1735
Depth to Product (ft. BTOC) NA	Purge End Time (24-hr) 1750
Product Thickness (ft) NA	Total Purge Time (min) 19

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.;

Min. purge volume if required: purge volume (gal) = volume of water/ft_____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4' – 0.653 gal/ft	6' – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameter for 3 consecutive reading [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate (gal/ minute)	Purge Volume (gal)	Temp (°C) (± 3 %)	Specific Conductance (µS/cm°) (± 3%)	DO (mg/L) (± 10%)	ORP (mV) (± 10mV)	pH (± 0.1)	Turbidity (NTU) (± 10%)	DTW (ft BTOC)	Drawdown (ft) (Max____ft)
Parameters collected following sample collection (not using flow through cell).										
1755	NA	NA	2.15	1.039		-24.4	9.64	High	NA	

Water recharged slower than the slowest pump setting therefore, the well was purged dry and the sample was collected from the water that recharged. An additional aliquot was collected after sampling for a single reading of field water quality parameters.

Sample Color: Slightly cloudy **Sample Odor:** Couldn't tell **Sheen:** Yes

Analytical Sampling

Analyses	Number/Type of Bottle	Preservative/ Comments	Analyses	Number/Type of Bottle	Preservative/ Comments
(GRO) BTEX AK101	3x40ml	HCl	Total Metals		
(DRO) AK102	2x250ml	HCl	Dissolved Metals		
RRO					
(VOCs) 8260B	3x 40 ml	HCl			
SVOCs					
(PAHs) 8270B	2 x 250ml	None			

Notes:

Equipment: Pump Type Peristaltic Tubing (Type/Length) Teflon-lined Bailer Type —

Water Level Meter 100-ft Multi-Parameter Meter (Make/SN#) YSI 556

Turbidity Meter (Make/SN#) LaMotte 2020e Filter Lot # —

IDW Disposal: ☐ Discharged to surface ☐ Treated (how?)_____ ☒ Other: Collected in drum.

Location Kotzebue Airport Date 9/30/15

Project / Client Alaska Airlines

Ben Siwiec - SLR

0830 Arrive in Kotzebue
Weather 33° Cloudy, windy, snow showers

0900 Get rental vehicle from Drake.

0930 Talk to Alaska Airlines staff, Walk around site. Note that MW3 has no cover. Also super sacks from soil dig are still here.

1125 Drake Construction arrives.

1200 MW3 decommission complete. MW3 was in very poor condition - monument mangled, PVC smashed and bent. Top 3 ft of PVC broke off. Could not feel PVC below break. Inserted bar, could not penetrate 3 ft. Bar came up with old bentonite. Poured new bentonite to 1ft depth. Clean sand/gravel to surface.

1210 Begin augering new MW-3.

1230 Drilled to 6 ft, hole stays open to 4 ft. 6 ft is

Location Kotzebue Airport Date 9/30/15

Project / Client Alaska Airlines

Ben Siwiec - SLR

max depth for this equip. Drake is bringing rig for greater depth. Groundwater not detected at 4ft. Soil moist at 6ft - possibly in groundwater.

1220 Waste char. soil sample 093015MW3S collected from auger cuttings ~3-6 ft. PID from same interval 1076. (headspace). Note - PID was not calibrated as cal gas bag was damaged.

1350 Drake returns with large drill rig. Well completed to 5.5 ft

1500 Well installed and monument set.

1505 Move over to MW1

1530 Boring drilled to about 6 ft
Well installed. Water is at surface in boring - expecting it to fall back.

98

Location Kotzebue Airport. Date 9/30/15

Project / Client Alaska Airlines

Ben Siwiec - SLR

1530 Collect Waste Characterization soil sample from auger cuttings at MW1 Sample interval a composite over most of boring.

PID: 15.0

1630 Off airport

BS
9/30/15

99

Location Kotzebue Airport Date 10/1/15

Project / Client Alaska Airlines

Ben Siwiec - SLR

1000 - Go to Drake Construction and talk to John and Mike. Mike emails us insurance info.

1030 Talk to Alaska Airlines, receive Goldstreak shipments.

1100 Get gear out on tarmac Drake arrives, transfers soil from their tote to super sack (just one). Labeled SS1 Generated 10/1/15.

1150 Sample 100115SS1 collected from sack SS1 (soil).

1200 MW1 monument completed, ready to dev. and sample. Drake working on replacing MW-2 monument.

1215 Drake finished, offsite. Begin development of MW1-R

1345 Purged approx 0.5 gal MW1R very slow to recharge. Will let it sit while I sample MW2.

1400 Collect sample 100115MW2 from MW2.

Location Kotzebue Airport Date 10/1/15

Project / Client Alaska Airlines

Ben Siwiec - SLR

MW2 produced water well. Sample had sediment. well water was clear but with visible sediment.

1330 Drake completed RTK survey of all 3 wells.

1445 Beginnig daulopment at MW3R
Intitial DTW: 3.23 BTOC
TD: 5.40 BTOC
Surged and purged for 5 min. Produced less than 1 quart. Will work on MW1R while this recharges.

1614 Turbidimeter breaks. will need solder for repair. No more turb measurements.

1422 Collect sample 100115MW1R and dupicate for PAH only: 100115MW5
Well produced water well, low turbidity.
Note approx 1.75 gal produced from MW1R development.

1710 Begin work on MW3R sample
DTW: 3.36

Location Kotzebue Airport Date 10/1/15

Project / Client Alaska Airlines

Ben Siwiec - SLR

1731 Begin purge

1750 Well does not recharge at the slowest possible pumping rate. Therefore sample will be collected after well purged totally dry and recharged. Total purged 0.5 gal prior to sampling.
As part of development, 1.1 gal was purged.

1755 Sample collected at MW3R
Note evening flight was canceled so Ben Siwiec will be staying an additional night.

1910 Gear packed up and stored for the night. ~~Code BS~~
Off airport.

BS
10/1/15

Location Kotzebue Airport Date 10/2/15

Project / Client Alaska Airlines

Ben Siwiec

1100 At airport, repack samples prepare equipment for shipment, ship on air cargo. Label waste water drum on tarmac.

1600 Leave Kotzebue on Alaska Airlines

2230 Arrive in Anchorage.

BS
10/2/15

Location Date

Project / Client

APPENDIX C

ADEC BUILDING SURVEY AND INDOOR AIR SAMPLING QUESTIONNAIRE

ALASKA AIRLINES
Alaska Airlines, Inc
PO Box 68900-SEAZE
Seattle, WA 98168-0900

December 2015

APPENDIX I

DEC Building Survey and Indoor Air Sampling Questionnaire

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ALASKA DEPARTMENT OF ENVIRONMENAL CONSERVATION
BUILDING INVENTORY AND INDOOR AIR SAMPLING QUESTIONNAIRE

This form should be prepared by a person familiar with indoor air assessments with assistance from a person knowledgeable about the building. Complete this form for each building where interior samples (e.g., indoor air, crawl space, or subslab soil gas samples) will be collected. Section I of this form should be used to assist in choosing an investigative strategy during workplan development. Section II should be used to assist in identification of complicating factors during a presampling building walk-through.

Preparer's Name Ben Siwec Date/Time Prepared 09:00, 10/2/15

Preparer's Affiliation SLR International Corp Phone No. 907-222-1112

Purpose of Investigation Groundwater sampling at Wein Memorial Airport, Kotzebue

SECTION I: BUILDING INVENTORY

1. **OCCUPANT OR BUILDING PERSONNEL:**

Interviewed (Y) / N

Last Name ~~Dawn K~~ Carl First Name ~~Karl~~ Dawn

Address ~~Air~~ Alaska Air Terminal

City Kotzebue

Phone No. 714-872-3745

Number of Occupants/people at this location Varies Age of Occupants varies

2. **OWNER or LANDLORD:** (Check if same as occupant X.)

Interviewed: Y / N

Last Name First Name

Address

City

Phone No.

3. **BUILDING CHARACTERISTICS**

Type of Building: (Circle appropriate response.)

Residential	School	(Commercial/Multi-use)
Industrial	Church	~~Other~~

If the property is residential, what type? (Circle appropriate response.)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouse/Condo
Modular	Log Home	Other

If multiple units, how many?

If the property is commercial, what type?

Business types(s) Air terminal

Does it include residences (i.e., multi-use)? Y (N) If yes, how many?

Other characteristics:

Number of floors 2 Building age Not known

Is the building insulated? (Y) / N How airtight? Tight / Average / (Not Tight)

Have occupants noticed chemical odors in the building? (Y) / N

If yes, please describe: Equipment exhaust (part of building is a garage) - only in garage area

4. **AIRFLOW**

Use air current tubes, tracer smoke, or knowledge about the building to evaluate airflow patterns and qualitatively describe:

Airflow between floors
Yes - air can flow through/between ceiling tiles

Airflow in building near suspected source
Air frequently flows due to large garage doors opening and forced air heat

Outdoor air infiltration
only at doors (man doors and garage doors)

Infiltration into air ducts
No - chemicals not stored in non-garage side of building

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply.)

a. Above-grade construction:	wood frame	log	concrete	brick	Metal building on concrete slab
	constructed on pilings with enclosed air space		constructed on pilings with open air space		
b. Basement type:	full	crawlspace	~~slab-on-grade~~	other No basement	
c. Basement floor:	concrete	dirt	stone	other NA	
d. Basement floor: No basement	unsealed	sealed	sealed with Insulation under replaced floor.		
e. Foundation walls:	poured	block	stone	other None	
f. Foundation walls:	unsealed	sealed	sealed with None		
g. The basement is:	wet	damp	dry NA		
h. The basement is:	finished	unfinished	partially finished NA		
i. Sump present?	(Y) / N – sump connected to floor drains in garage				
j. Water in sump?	(Y) / N / not applicable Garage floor drains				

Basement or lowest level depth below grade approx 3 ft in (feet). Sump vaults.

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, and drains).

Very thin cracks in garage floor visible. Unknown if sumps are entry points.

6. **HEATING, VENTING, and AIR CONDITIONING** (Circle all that apply.)

Type of heating system(s) used in this building: (Circle all that apply – not just primary.)

Hot air circulation	Heat pump	Hot water baseboard	
Space heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other Blowers in garage

Heat system is fuel oil boiler, circulated glycol to blowers

The primary type of fuel used is:

Natural gas	Fuel oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank is fueled by: fuel oil

Boiler/furnace is located in: Basement Outdoors Main floor Other Upstairs

Do any of the heating appliances have cold-air intakes? (Y) / N

Type of air conditioning or ventilation used in this building:

Central air boiler	Window units	Open windows	None
Commercial HVAC	Heat-recovery system	Passive air system	

Are there air distribution ducts present? (Y) / N

Describe the ventilation system in the building, its condition where visible, and the tightness of duct joints. Indicate the location of air supply and exhaust points on the floor plan.

Looks intact where exposed. Some ducts are inside ceiling.

Is there a radon mitigation system for the building/structure? Y (N) Date of Installation_____

Is the system active or passive? Active/Passive

7. **OCCUPANCY**

Is basement/lowest level occupied? (Full-time) Occasionally Seldom Almost never — daytime working hours only

Level	**General Use of Each Floor (e.g., family room, bedroom, laundry, workshop, or storage).**
~~Basement~~	NA
1st Floor	Air passenger terminal and garage, restrooms
2nd Floor	Office, kitchen area
3rd Floor	NA

8. **WATER AND SEWAGE**

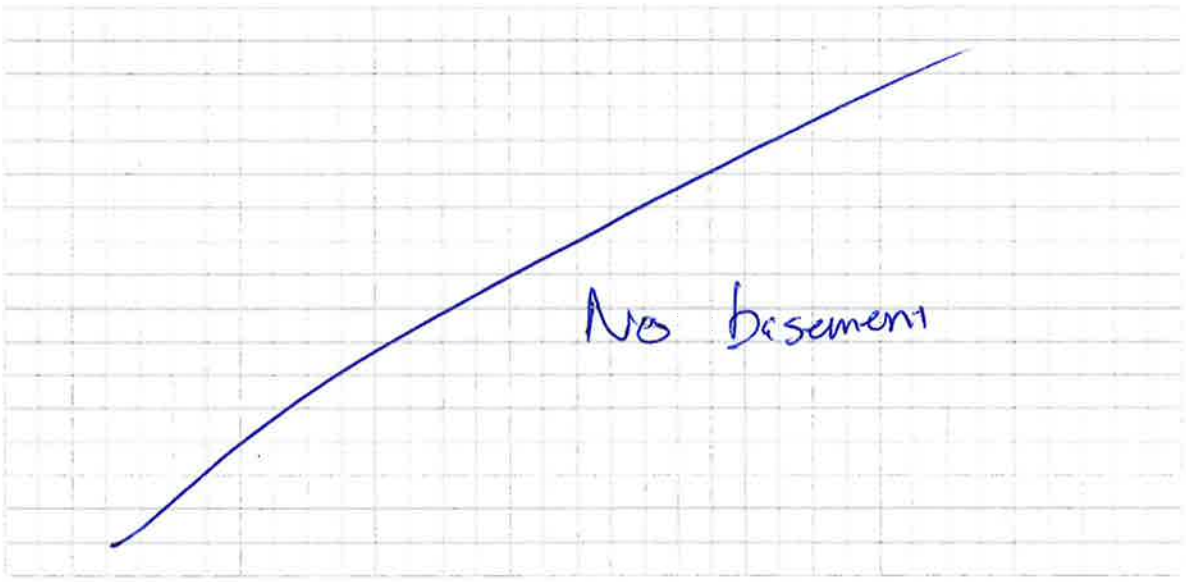
Water supply: (Public water) Drilled well Driven well Dug well Other_____

Sewage disposal: (Public sewer) Septic tank Leach field Dry well Other_____

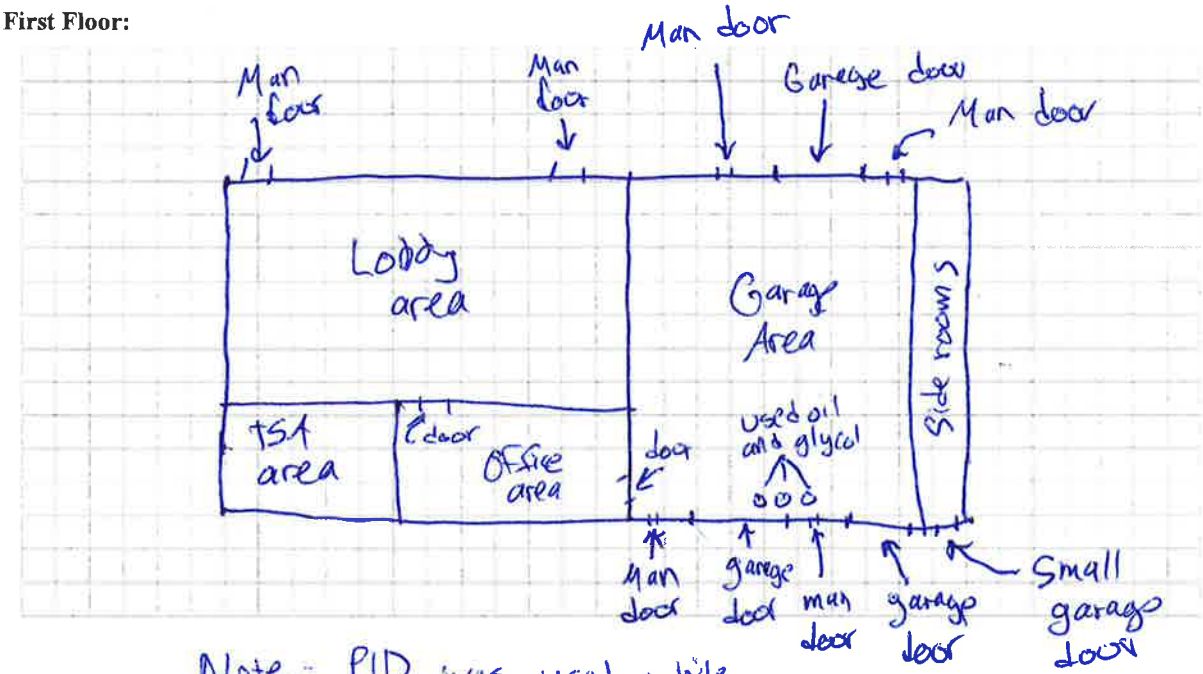
9. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note that.

Basement:



First Floor:



Note: PID was used while walking around garage, office, and lobby area. All readings were 0.0 PPM

10. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (e.g., industries, gas stations, repair shops, landfills, etc.), outdoor air sampling locations and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the location of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

See attached Figure

SECTION II: INDOOR AIR SAMPLING QUESTIONNAIRE

This section should be completed during a presampling walk-through. If indoor air sources of COCs are identified and removed, consider ventilating the building prior to sampling. However, ventilation and heating systems should be operating normally for 24 hours prior to sampling.

a) 1. **FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY**

Is there an attached garage? (Y) / N

Does the garage have a separate heating unit? (Y) / N / NA

Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, ATV, or car) (Y) / N / NA

Please specify Fork Lifts

Has the building ever had a fire? Y / (N) When?_____

Is a kerosene or unvented gas space heater present? Y / (N) Where?_____

Is there a workshop or hobby/craft area? (Y) / N Where and type_____

Is there smoking in the building? Y / (N) How frequently?_____

Has painting/staining been done in the last six months? Y / (N) Where and when?_____

Is there new carpet, drapes or other textiles? Y / (N) Where and when?_____

Is there a kitchen exhaust fan? (Y) / N If yes, where is it vented?_____

Is there a bathroom exhaust fan? (Y) / N If yes, where is it vented?_____

Is there a clothes dryer? Y / (N) If yes, is it vented outside? Y / N

Are cleaning products, cosmetic products, or pesticides used that could interfere with indoor air sampling? (Y) / N

If yes, please describe bathroom cleaning products

Do any of the building occupants use solvents at work? (Y) / N

(For example, is the building used for chemical manufacturing or a laboratory, auto mechanic or auto body shop, painting shop, fuel oil delivery area, or do any of the occupants work as a boiler mechanic, pesticide applicator, or cosmetologist?)

If yes, what types of solvents are used? Turpentine

If yes, are his/her/their clothes washed at work? Y / (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry cleaning regularly (weekly) (No)

Yes, use dry cleaning infrequently (monthly or less) NO Unknown

Yes, work at a dry cleaning services NO

2. **PRODUCT INVENTORY FORM** (For use during building walk-through.)

Make and model of field instrument used: —

List specific products found in the residence that have the potential to affect indoor air quality:

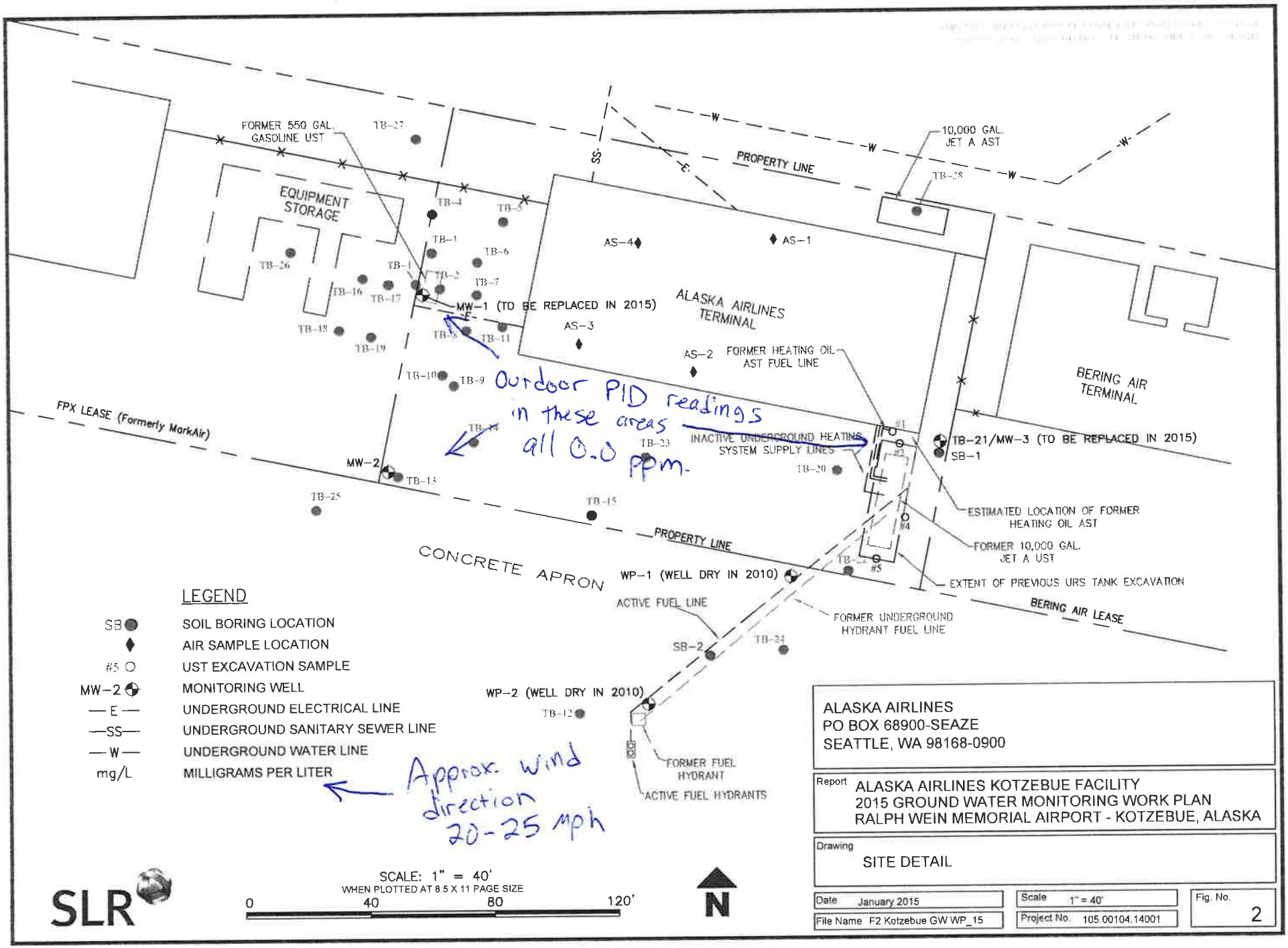
Location	Product Description	Site (units)	Condition[1]	Chemical Ingredients	Field Instrument Reading (units)	Photo[2] Y / N
Garage	Oil drum	3	good	Used oil and glycol	0.0 PPM	N

1 Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D).**

2 Photographs of the front and back of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

This form was modified from:

ITRC (Interstate Technology and Regulatory Council). 2007. *Vapor Intrusion Pathway: A Practical Guideline*. VI-1. Washington, D.C.: Interstate Technology and Regulatory Council, Vapor Intrusion Team. Available at: www.itrcweb.org.



ALASKA AIRLINES
PO BOX 68900-SEAZE
SEATTLE, WA 98168-0900

Report: ALASKA AIRLINES KOTZEBUE FACILITY
2015 GROUND WATER MONITORING WORK PLAN
RALPH WEIN MEMORIAL AIRPORT - KOTZEBUE, ALASKA

Drawing: SITE DETAIL

Date: January 2015	Scale: 1" = 40'	Fig. No. 2
File Name: F2 Kotzebue GW WP_15	Project No.: 105.00104.14001	

APPENDIX D

SGS LABORATORY DATA REPORTS

ALASKA AIRLINES
Alaska Airlines, Inc
PO Box 68900-SEAZE
Seattle, WA 98168-0900

December 2015

Laboratory Report of Analysis

To: SLR Alaska-Anchorage
2700 Gambell St Suite 200
Anchorage, AK 99503
(907)222-1112

Report Number: **1155836**

Client Project: **105.00104.14001 AK Air Kotz GW**

Dear Jason Gray,

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

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

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

Sincerely,
SGS North America Inc.

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

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

SGS North America Inc.

Case Narrative

Customer: SLRANCH **SLR Alaska-Anchorage**

Project: 1155836 **105.00104.14001 AK Air Kotz GW**

NPDL WO:

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

1155836001 PS **100115MW1R**

AK101 - Surrogate recovery for 4-bromofluorobenzene (173%) does not meet QC criteria due to matrix interference.

1155836009 PS **093015MW35**

AK101 - GRO result is above calibration range (4000 parts per billion); the sample could not be reanalyzed within hold time and the original results were approved, per QA.

AK101 - Surrogate recovery for 4-bromofluorobenzene (458%) does not meet QC criteria due to matrix interference.

1295863 LCSD **XXX/3434**

8270D SIM - LCS/LCSD RPD for fluorene (21.1%) and phenanthrene (22.5%) does not meet QC criteria. These analytes were not detected above the LOQ in the associated samples. RPD for fluoranthene is within criteria after application of rounding rules.

1297312 LCS **VXX/28064**

8260B – LCS recoveries for several analytes do not meet QC criteria (biased high). These analytes were not detected above the LOQ in the associated samples.

1297313 MS **1158702018MS**

8260B –-MS recovery for Hexachlorobutadiene does not meet QC criteria. Refer to LCS for accuracy.

1297314 MSD **1158702018MSD**

8260B –-MS/MSD recoveries for several analytes do not meet QC criteria. Refer to LCS for accuracy.

8260B –-MS/MSD RPD for several analytes do not meet QC criteria. These analytes were not detected above the LOQ in the associated samples.

1297576 MSD **1297574MSD**

8260B –-MS/MSD RPD for 1,2,3-Trichlorobenzene and Naphthalene do not meet QC criteria. These analytes were not detected above the LOQ in the associated samples.

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

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8260B				
1155836008	093015MW15	VMS15331	4-Isopropyltoluene	SP
1155836010	100115SS1	VMS15331	4-Isopropyltoluene	SP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 10/30/2015 11:39:16AM

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

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

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
100115MW1R	1155836001	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
100115MW2	1155836002	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
100115MW3R	1155836003	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
100115MW4	1155836004	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
100115MW5	1155836005	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
GWTB1	1155836006	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
GWTB2	1155836007	10/01/2015	10/05/2015	Water (Surface, Eff., Ground)
093015MW15	1155836008	09/30/2015	10/05/2015	Soil/Solid (dry weight)
093015MW35	1155836009	09/30/2015	10/05/2015	Soil/Solid (dry weight)
100115SS1	1155836010	10/01/2015	10/05/2015	Soil/Solid (dry weight)
STB1	1155836011	09/30/2015	10/05/2015	Soil/Solid (dry weight)

Method	Method Description
8270D SIMS LV (PAH)	8270 PAH SIM GC/MS Liq/Liq ext. LV
AK102	Diesel Range Organics (S)
AK102	DRO Low Volume (W)
AK101	Gasoline Range Organics (S)
AK101	Gasoline Range Organics (W)
SM21 2540G	Percent Solids SM2540G
SW8260B	VOC 8260 (S) Field Extracted
SW8260B	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **100115MW1R**
Lab Sample ID: 1155836001

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	5.24	ug/L
	2-Methylnaphthalene	6.28	ug/L
	Naphthalene	31.5	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	3.22	mg/L
Volatile Fuels	Gasoline Range Organics	1.90	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	182	ug/L
	1,3,5-Trimethylbenzene	59.2	ug/L
	4-Isopropyltoluene	10.3	ug/L
	Benzene	24.5	ug/L
	Dichlorodifluoromethane	8.40J	ug/L
	Ethylbenzene	68.8	ug/L
	Isopropylbenzene (Cumene)	16.4	ug/L
	Naphthalene	46.8J	ug/L
	n-Propylbenzene	27.5	ug/L
	o-Xylene	51.6	ug/L
	P & M -Xylene	311	ug/L
	sec-Butylbenzene	5.50J	ug/L
	Toluene	3.20J	ug/L
	Xylenes (total)	363	ug/L

Client Sample ID: **100115MW2**
Lab Sample ID: 1155836002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.47	mg/L
Volatile Fuels	Gasoline Range Organics	0.0740J	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	0.610J	ug/L
	Benzene	13.0	ug/L
	Dichlorodifluoromethane	21.0	ug/L
	Ethylbenzene	0.810J	ug/L
	P & M -Xylene	0.960J	ug/L

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Detectable Results Summary

Client Sample ID: **100115MW3R**
Lab Sample ID: 1155836003

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.266	ug/L
	Acenaphthene	0.263	ug/L
	Naphthalene	1.70	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	11.1	mg/L
Volatile Fuels	Gasoline Range Organics	3.10	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	34.7	ug/L
	1,3,5-Trimethylbenzene	22.5	ug/L
	Benzene	55.3	ug/L
	Ethylbenzene	245	ug/L
	Isopropylbenzene (Cumene)	7.80J	ug/L
	n-Propylbenzene	5.90J	ug/L
	o-Xylene	135	ug/L
	P & M -Xylene	674	ug/L
	Xylenes (total)	809	ug/L

Client Sample ID: **100115MW4**
Lab Sample ID: 1155836004

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	2.29	mg/L
Volatile Fuels	Gasoline Range Organics	0.0923J	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	0.660J	ug/L
	1,3,5-Trimethylbenzene	0.360J	ug/L
	Benzene	12.9	ug/L
	Dichlorodifluoromethane	18.5	ug/L
	Ethylbenzene	0.780J	ug/L
	P & M -Xylene	0.960J	ug/L

Client Sample ID: **100115MW5**
Lab Sample ID: 1155836005

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	4.68	ug/L
	2-Methylnaphthalene	5.56	ug/L
	Acenaphthene	0.167	ug/L
	Naphthalene	31.9	ug/L

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Detectable Results Summary

Client Sample ID: **093015MW15**
Lab Sample ID: 1155836008

Semivolatile Organic Fuels
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	178	mg/Kg
Gasoline Range Organics	5.39	mg/Kg
1,2,4-Trimethylbenzene	232	ug/Kg
1,3,5-Trimethylbenzene	86.5	ug/Kg
4-Isopropyltoluene	14.6J	ug/Kg
Benzene	23.9	ug/Kg
Ethylbenzene	72.6	ug/Kg
Isopropylbenzene (Cumene)	15.7J	ug/Kg
Naphthalene	191	ug/Kg
n-Propylbenzene	42.6	ug/Kg
o-Xylene	57.7	ug/Kg
P & M -Xylene	280	ug/Kg
sec-Butylbenzene	13.0J	ug/Kg
Toluene	51.3	ug/Kg
Xylenes (total)	337	ug/Kg

Client Sample ID: **093015MW35**
Lab Sample ID: 1155836009

Semivolatile Organic Fuels
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	109	mg/Kg
Gasoline Range Organics	189	mg/Kg
1,2,4-Trimethylbenzene	1050	ug/Kg
1,3,5-Trimethylbenzene	628	ug/Kg
4-Isopropyltoluene	182	ug/Kg
Benzene	14.6J	ug/Kg
Ethylbenzene	2100	ug/Kg
Isopropylbenzene (Cumene)	64.9	ug/Kg
Naphthalene	213	ug/Kg
n-Propylbenzene	128	ug/Kg
o-Xylene	1250	ug/Kg
P & M -Xylene	7700	ug/Kg
sec-Butylbenzene	30.2J	ug/Kg
tert-Butylbenzene	72.3	ug/Kg
Toluene	38.0J	ug/Kg
Xylenes (total)	8950	ug/Kg

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Detectable Results Summary

Client Sample ID: **100115SS1**
Lab Sample ID: 1155836010

Semivolatile Organic Fuels
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	139	mg/Kg
Gasoline Range Organics	41.4	mg/Kg
1,2,4-Trimethylbenzene	433	ug/Kg
1,3,5-Trimethylbenzene	208	ug/Kg
4-Isopropyltoluene	31.1J	ug/Kg
Benzene	11.5J	ug/Kg
Ethylbenzene	530	ug/Kg
Isopropylbenzene (Cumene)	32.6J	ug/Kg
Naphthalene	161	ug/Kg
n-Propylbenzene	66.3	ug/Kg
o-Xylene	305	ug/Kg
P & M -Xylene	1640	ug/Kg
sec-Butylbenzene	20.0J	ug/Kg
tert-Butylbenzene	25.2J	ug/Kg
Toluene	14.1J	ug/Kg
Xylenes (total)	1940	ug/Kg

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Results of **100115MW1R**

Client Sample ID: **100115MW1R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836001
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	5.24		0.0481	0.0144	ug/L	1		10/22/15 00:59
2-Methylnaphthalene	6.28		0.0481	0.0144	ug/L	1		10/22/15 00:59
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Benzo[a]pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Dibenzo[a,h]anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Naphthalene	31.5		0.962	0.298	ug/L	10		10/22/15 18:55
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 00:59
Surrogates								
2-Fluorobiphenyl (surr)	73.9		53-106		%	1		10/22/15 00:59
Terphenyl-d14 (surr)	104		58-132		%	1		10/22/15 00:59

Batch Information

Analytical Batch: XMS9000
Analytical Method: 8270D SIMS LV (PAH)
Analyst: NRB
Analytical Date/Time: 10/22/15 00:59
Container ID: 1155836001-I

Prep Batch: XXX34344
Prep Method: SW3520C
Prep Date/Time: 10/07/15 10:30
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS9004
Analytical Method: 8270D SIMS LV (PAH)
Analyst: NRB
Analytical Date/Time: 10/22/15 18:55
Container ID: 1155836001-I

Prep Batch: XXX34344
Prep Method: SW3520C
Prep Date/Time: 10/07/15 10:30
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **100115MW1R**

Client Sample ID: **100115MW1R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836001
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.22		0.581	0.174	mg/L	1		10/15/15 06:19
Surrogates								
5a Androstane (surr)	87.1		50-150		%	1		10/15/15 06:19

Batch Information

Analytical Batch: XFC12158
Analytical Method: AK102
Analyst: KJO
Analytical Date/Time: 10/15/15 06:19
Container ID: 1155836001-G

Prep Batch: XXX34405
Prep Method: SW3520C
Prep Date/Time: 10/14/15 10:08
Prep Initial Wt./Vol.: 258 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115MW1R**

Client Sample ID: **100115MW1R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836001
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.90		0.100	0.0310	mg/L	1		10/14/15 01:09
Surrogates								
4-Bromofluorobenzene (surr)	173	*	50-150		%	1		10/14/15 01:09

Batch Information

Analytical Batch: VFC12746
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/14/15 01:09
Container ID: 1155836001-B

Prep Batch: VXX28072
Prep Method: SW5030B
Prep Date/Time: 10/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW1R**

Client Sample ID: **100115MW1R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836001
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
1,1,1-Trichloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,1,2,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
1,1,2-Trichloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,1-Dichloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,1-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,1-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,2,3-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,2,3-Trichloropropane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,2,4-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,2,4-Trimethylbenzene	182		10.0	3.10	ug/L	10		10/09/15 13:30
1,2-Dibromo-3-chloropropane	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
1,2-Dibromoethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,2-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,2-Dichloroethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
1,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,3,5-Trimethylbenzene	59.2		10.0	3.10	ug/L	10		10/09/15 13:30
1,3-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
1,3-Dichloropropane	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
1,4-Dichlorobenzene	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
2,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
2-Butanone (MEK)	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
2-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
2-Hexanone	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
4-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
4-Isopropyltoluene	10.3		10.0	3.10	ug/L	10		10/09/15 13:30
4-Methyl-2-pentanone (MIBK)	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
Benzene	24.5		4.00	1.20	ug/L	10		10/09/15 13:30
Bromobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Bromochloromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Bromodichloromethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
Bromoform	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Bromomethane	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
Carbon disulfide	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
Carbon tetrachloride	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Chlorobenzene	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
Chloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30

Results of **100115MW1R**

Client Sample ID: **100115MW1R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836001
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	5.00	U	10.0	3.00	ug/L	10		10/09/15 13:30
Chloromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
cis-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
cis-1,3-Dichloropropene	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
Dibromochloromethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 13:30
Dibromomethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Dichlorodifluoromethane	8.40	J	10.0	3.10	ug/L	10		10/09/15 13:30
Ethylbenzene	68.8		10.0	3.10	ug/L	10		10/09/15 13:30
Freon-113	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
Hexachlorobutadiene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Isopropylbenzene (Cumene)	16.4		10.0	3.10	ug/L	10		10/09/15 13:30
Methylene chloride	25.0	U	50.0	10.0	ug/L	10		10/09/15 13:30
Methyl-t-butyl ether	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
Naphthalene	46.8	J	100	31.0	ug/L	10		10/09/15 13:30
n-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
n-Propylbenzene	27.5		10.0	3.10	ug/L	10		10/09/15 13:30
o-Xylene	51.6		10.0	3.10	ug/L	10		10/09/15 13:30
P & M -Xylene	311		20.0	6.20	ug/L	10		10/09/15 13:30
sec-Butylbenzene	5.50	J	10.0	3.10	ug/L	10		10/09/15 13:30
Styrene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
tert-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Tetrachloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Toluene	3.20	J	10.0	3.10	ug/L	10		10/09/15 13:30
trans-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
trans-1,3-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Trichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Trichlorofluoromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Vinyl acetate	50.0	U	100	31.0	ug/L	10		10/09/15 13:30
Vinyl chloride	5.00	U	10.0	3.10	ug/L	10		10/09/15 13:30
Xylenes (total)	363		30.0	10.0	ug/L	10		10/09/15 13:30
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	10		10/09/15 13:30
4-Bromofluorobenzene (surr)	96.2		85-114		%	10		10/09/15 13:30
Toluene-d8 (surr)	99.6		89-112		%	10		10/09/15 13:30

Results of **100115MW1R**

Client Sample ID: **100115MW1R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836001
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Analyst: SCL
Analytical Date/Time: 10/09/15 13:30
Container ID: 1155836001-D

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/09/15 08:59
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW2**

Client Sample ID: **100115MW2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836002
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.47		0.581	0.174	mg/L	1		10/15/15 06:40
Surrogates								
5a Androstane (surr)	89.1		50-150		%	1		10/15/15 06:40

Batch Information

Analytical Batch: XFC12158
Analytical Method: AK102
Analyst: KJO
Analytical Date/Time: 10/15/15 06:40
Container ID: 1155836002-G

Prep Batch: XXX34405
Prep Method: SW3520C
Prep Date/Time: 10/14/15 10:08
Prep Initial Wt./Vol.: 258 mL
Prep Extract Vol: 1 mL

Results of **100115MW2**

Client Sample ID: **100115MW2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836002
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0740	J	0.100	0.0310	mg/L	1		10/14/15 01:28
Surrogates								
4-Bromofluorobenzene (surr)	91.9		50-150		%	1		10/14/15 01:28

Batch Information

Analytical Batch: VFC12746
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/14/15 01:28
Container ID: 1155836002-B

Prep Batch: VXX28072
Prep Method: SW5030B
Prep Date/Time: 10/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW2**

Client Sample ID: **100115MW2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836002
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
1,1,2-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,2,4-Trimethylbenzene	0.610	J	1.00	0.310	ug/L	1		10/09/15 17:26
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
1,2-Dibromoethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
Benzene	13.0		0.400	0.120	ug/L	1		10/09/15 17:26
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
Bromoform	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Bromomethane	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
Chloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115MW2**

Client Sample ID: **100115MW2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836002
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.300	ug/L	1		10/09/15 17:26
Chloromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:26
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Dichlorodifluoromethane	21.0		1.00	0.310	ug/L	1		10/09/15 17:26
Ethylbenzene	0.810	J	1.00	0.310	ug/L	1		10/09/15 17:26
Freon-113	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		10/09/15 17:26
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
Naphthalene	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
P & M -Xylene	0.960	J	2.00	0.620	ug/L	1		10/09/15 17:26
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Styrene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Toluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:26
Vinyl chloride	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:26
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/09/15 17:26
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		10/09/15 17:26
4-Bromofluorobenzene (surr)	97.8		85-114		%	1		10/09/15 17:26
Toluene-d8 (surr)	93.8		89-112		%	1		10/09/15 17:26

Results of **100115MW2**

Client Sample ID: **100115MW2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836002
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Analyst: SCL
Analytical Date/Time: 10/09/15 17:26
Container ID: 1155836002-D

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/09/15 08:59
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW3R**

Client Sample ID: **100115MW3R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836003
Lab Project ID: 1155836

Collection Date: 10/01/15 17:55
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.266		0.0481	0.0144	ug/L	1		10/22/15 18:39
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Acenaphthene	0.263		0.0481	0.0144	ug/L	1		10/22/15 18:39
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Benzo[a]pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Dibenzo[a,h]anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Naphthalene	1.70		0.0962	0.0298	ug/L	1		10/22/15 18:39
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 18:39
Surrogates								
2-Fluorobiphenyl (surr)	61.3		53-106		%	1		10/22/15 18:39
Terphenyl-d14 (surr)	104		58-132		%	1		10/22/15 18:39

Batch Information

Analytical Batch: XMS9004
Analytical Method: 8270D SIMS LV (PAH)
Analyst: NRB
Analytical Date/Time: 10/22/15 18:39
Container ID: 1155836003-I

Prep Batch: XXX34344
Prep Method: SW3520C
Prep Date/Time: 10/07/15 10:30
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **100115MW3R**

Client Sample ID: **100115MW3R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836003
Lab Project ID: 1155836

Collection Date: 10/01/15 17:55
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.1		0.584	0.175	mg/L	1		10/15/15 07:00
Surrogates								
5a Androstane (surr)	90.8		50-150		%	1		10/15/15 07:00

Batch Information

Analytical Batch: XFC12158
Analytical Method: AK102
Analyst: KJO
Analytical Date/Time: 10/15/15 07:00
Container ID: 1155836003-G

Prep Batch: XXX34405
Prep Method: SW3520C
Prep Date/Time: 10/14/15 10:08
Prep Initial Wt./Vol.: 257 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115MW3R**

Client Sample ID: **100115MW3R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836003
Lab Project ID: 1155836

Collection Date: 10/01/15 17:55
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	3.10		0.100	0.0310	mg/L	1		10/14/15 02:25
Surrogates								
4-Bromofluorobenzene (surr)	116		50-150		%	1		10/14/15 02:25

Batch Information

Analytical Batch: VFC12746
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/14/15 02:25
Container ID: 1155836003-B

Prep Batch: VXX28072
Prep Method: SW5030B
Prep Date/Time: 10/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW3R**

Client Sample ID: **100115MW3R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836003
Lab Project ID: 1155836

Collection Date: 10/01/15 17:55
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
1,1,1-Trichloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,1,2,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
1,1,2-Trichloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,1-Dichloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,1-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,1-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,2,3-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,2,3-Trichloropropane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,2,4-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,2,4-Trimethylbenzene	34.7		10.0	3.10	ug/L	10		10/09/15 14:03
1,2-Dibromo-3-chloropropane	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
1,2-Dibromoethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,2-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,2-Dichloroethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
1,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,3,5-Trimethylbenzene	22.5		10.0	3.10	ug/L	10		10/09/15 14:03
1,3-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
1,3-Dichloropropane	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
1,4-Dichlorobenzene	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
2,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
2-Butanone (MEK)	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
2-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
2-Hexanone	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
4-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
4-Isopropyltoluene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
4-Methyl-2-pentanone (MIBK)	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
Benzene	55.3		4.00	1.20	ug/L	10		10/09/15 14:03
Bromobenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Bromochloromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Bromodichloromethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
Bromoform	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Bromomethane	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
Carbon disulfide	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
Carbon tetrachloride	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Chlorobenzene	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
Chloroethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115MW3R**

Client Sample ID: **100115MW3R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836003
Lab Project ID: 1155836

Collection Date: 10/01/15 17:55
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	5.00	U	10.0	3.00	ug/L	10		10/09/15 14:03
Chloromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
cis-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
cis-1,3-Dichloropropene	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
Dibromochloromethane	2.50	U	5.00	1.50	ug/L	10		10/09/15 14:03
Dibromomethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Dichlorodifluoromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Ethylbenzene	245		10.0	3.10	ug/L	10		10/09/15 14:03
Freon-113	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
Hexachlorobutadiene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Isopropylbenzene (Cumene)	7.80	J	10.0	3.10	ug/L	10		10/09/15 14:03
Methylene chloride	25.0	U	50.0	10.0	ug/L	10		10/09/15 14:03
Methyl-t-butyl ether	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
Naphthalene	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
n-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
n-Propylbenzene	5.90	J	10.0	3.10	ug/L	10		10/09/15 14:03
o-Xylene	135		10.0	3.10	ug/L	10		10/09/15 14:03
P & M -Xylene	674		20.0	6.20	ug/L	10		10/09/15 14:03
sec-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Styrene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
tert-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Tetrachloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Toluene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
trans-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
trans-1,3-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Trichloroethene	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Trichlorofluoromethane	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Vinyl acetate	50.0	U	100	31.0	ug/L	10		10/09/15 14:03
Vinyl chloride	5.00	U	10.0	3.10	ug/L	10		10/09/15 14:03
Xylenes (total)	809		30.0	10.0	ug/L	10		10/09/15 14:03
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	10		10/09/15 14:03
4-Bromofluorobenzene (surr)	97.1		85-114		%	10		10/09/15 14:03
Toluene-d8 (surr)	96.9		89-112		%	10		10/09/15 14:03

Results of **100115MW3R**

Client Sample ID: **100115MW3R**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836003
Lab Project ID: 1155836

Collection Date: 10/01/15 17:55
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Analyst: SCL
Analytical Date/Time: 10/09/15 14:03
Container ID: 1155836003-D

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/09/15 08:59
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW4**

Client Sample ID: **100115MW4**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836004
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.29		0.581	0.174	mg/L	1		10/15/15 07:21
Surrogates								
5a Androstane (surr)	98.5		50-150		%	1		10/15/15 07:21

Batch Information

Analytical Batch: XFC12158
Analytical Method: AK102
Analyst: KJO
Analytical Date/Time: 10/15/15 07:21
Container ID: 1155836004-G

Prep Batch: XXX34405
Prep Method: SW3520C
Prep Date/Time: 10/14/15 10:08
Prep Initial Wt./Vol.: 258 mL
Prep Extract Vol: 1 mL

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115MW4**

Client Sample ID: **100115MW4**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836004
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0923	J	0.100	0.0310	mg/L	1		10/14/15 02:44
Surrogates								
4-Bromofluorobenzene (surr)	92.5		50-150		%	1		10/14/15 02:44

Batch Information

Analytical Batch: VFC12746
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/14/15 02:44
Container ID: 1155836004-B

Prep Batch: VXX28072
Prep Method: SW5030B
Prep Date/Time: 10/13/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW4**

Client Sample ID: **100115MW4**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836004
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
1,1,2-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,2,4-Trimethylbenzene	0.660	J	1.00	0.310	ug/L	1		10/09/15 17:43
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
1,2-Dibromoethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,3,5-Trimethylbenzene	0.360	J	1.00	0.310	ug/L	1		10/09/15 17:43
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
Benzene	12.9		0.400	0.120	ug/L	1		10/09/15 17:43
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
Bromoform	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Bromomethane	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
Chloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43

Results of **100115MW4**

Client Sample ID: **100115MW4**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836004
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.300	ug/L	1		10/09/15 17:43
Chloromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 17:43
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Dichlorodifluoromethane	18.5		1.00	0.310	ug/L	1		10/09/15 17:43
Ethylbenzene	0.780	J	1.00	0.310	ug/L	1		10/09/15 17:43
Freon-113	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		10/09/15 17:43
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
Naphthalene	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
P & M -Xylene	0.960	J	2.00	0.620	ug/L	1		10/09/15 17:43
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Styrene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Toluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		10/09/15 17:43
Vinyl chloride	0.500	U	1.00	0.310	ug/L	1		10/09/15 17:43
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/09/15 17:43
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		10/09/15 17:43
4-Bromofluorobenzene (surr)	96.6		85-114		%	1		10/09/15 17:43
Toluene-d8 (surr)	99.8		89-112		%	1		10/09/15 17:43

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115MW4**

Client Sample ID: **100115MW4**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836004
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Analyst: SCL
Analytical Date/Time: 10/09/15 17:43
Container ID: 1155836004-D

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/09/15 08:59
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **100115MW5**

Client Sample ID: **100115MW5**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836005
Lab Project ID: 1155836

Collection Date: 10/01/15 16:22
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4.68		0.0481	0.0144	ug/L	1		10/22/15 01:15
2-Methylnaphthalene	5.56		0.0481	0.0144	ug/L	1		10/22/15 01:15
Acenaphthene	0.167		0.0481	0.0144	ug/L	1		10/22/15 01:15
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Benzo[a]pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Dibenzo[a,h]anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Naphthalene	31.9		0.962	0.298	ug/L	10		10/22/15 19:11
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/22/15 01:15
Surrogates								
2-Fluorobiphenyl (surr)	66.5		53-106		%	1		10/22/15 01:15
Terphenyl-d14 (surr)	110		58-132		%	1		10/22/15 01:15

Batch Information

Analytical Batch: XMS9000
Analytical Method: 8270D SIMS LV (PAH)
Analyst: NRB
Analytical Date/Time: 10/22/15 01:15
Container ID: 1155836005-A

Prep Batch: XXX34344
Prep Method: SW3520C
Prep Date/Time: 10/07/15 10:30
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS9004
Analytical Method: 8270D SIMS LV (PAH)
Analyst: NRB
Analytical Date/Time: 10/22/15 19:11
Container ID: 1155836005-A

Prep Batch: XXX34344
Prep Method: SW3520C
Prep Date/Time: 10/07/15 10:30
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **GWTB1**

Client Sample ID: **GWTB1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836006
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		10/10/15 03:39
Surrogates								
4-Bromofluorobenzene (surr)	96.8		50-150		%	1		10/10/15 03:39

Batch Information

Analytical Batch: VFC12734
Analytical Method: AK101
Analyst: KAS
Analytical Date/Time: 10/10/15 03:39
Container ID: 1155836006-A

Prep Batch: VXX28059
Prep Method: SW5030B
Prep Date/Time: 10/09/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **GWTB2**

Client Sample ID: **GWTB2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836007
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
1,1,2-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
1,2-Dibromoethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
Benzene	0.200	U	0.400	0.120	ug/L	1		10/09/15 13:13
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
Bromoform	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Bromomethane	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
Chloroethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **GWTB2**

Client Sample ID: **GWTB2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836007
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.300	ug/L	1		10/09/15 13:13
Chloromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		10/09/15 13:13
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Freon-113	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		10/09/15 13:13
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
Naphthalene	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/09/15 13:13
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Styrene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Toluene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		10/09/15 13:13
Vinyl chloride	0.500	U	1.00	0.310	ug/L	1		10/09/15 13:13
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/09/15 13:13
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		10/09/15 13:13
4-Bromofluorobenzene (surr)	104		85-114		%	1		10/09/15 13:13
Toluene-d8 (surr)	104		89-112		%	1		10/09/15 13:13

Results of **GWTB2**

Client Sample ID: **GWTB2**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836007
Lab Project ID: 1155836

Collection Date: 10/01/15 14:00
Received Date: 10/05/15 08:44
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Analyst: SCL
Analytical Date/Time: 10/09/15 13:13
Container ID: 1155836007-A

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/09/15 08:59
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **093015MW15**

Client Sample ID: **093015MW15**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836008
Lab Project ID: 1155836

Collection Date: 09/30/15 15:30
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	178		89.2	27.7	mg/Kg	4		10/12/15 05:31
Surrogates								
5a Androstane (surr)	90.6		50-150		%	4		10/12/15 05:31

Batch Information

Analytical Batch: XFC12151
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 10/12/15 05:31
Container ID: 1155836008-A

Prep Batch: XXX34370
Prep Method: SW3550C
Prep Date/Time: 10/09/15 12:22
Prep Initial Wt./Vol.: 30.081 g
Prep Extract Vol: 1 mL

Results of **093015MW15**

Client Sample ID: **093015MW15**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836008
Lab Project ID: 1155836

Collection Date: 09/30/15 15:30
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	5.39		2.66	0.798	mg/Kg	1		10/28/15 19:10
Surrogates								
4-Bromofluorobenzene (surr)	109		50-150		%	1		10/28/15 19:10

Batch Information

Analytical Batch: VFC12781
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/28/15 19:10
Container ID: 1155836008-B

Prep Batch: VXX28170
Prep Method: SW5035A
Prep Date/Time: 09/30/15 15:30
Prep Initial Wt./Vol.: 67.532 g
Prep Extract Vol: 32.1353 mL

Results of **093015MW15**

Client Sample ID: **093015MW15**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836008
Lab Project ID: 1155836

Collection Date: 09/30/15 15:30
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.4
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,1,1-Trichloroethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,1,2,2-Tetrachloroethane	6.65	U	13.3	4.15	ug/Kg	1		10/12/15 19:12
1,1,2-Trichloroethane	5.30	U	10.6	3.30	ug/Kg	1		10/12/15 19:12
1,1-Dichloroethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,1-Dichloroethene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,1-Dichloropropene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,2,3-Trichlorobenzene	26.6	U	53.2	16.0	ug/Kg	1		10/12/15 19:12
1,2,3-Trichloropropane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,2,4-Trichlorobenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,2,4-Trimethylbenzene	232		53.2	16.0	ug/Kg	1		10/12/15 19:12
1,2-Dibromo-3-chloropropane	53.0	U	106	33.0	ug/Kg	1		10/12/15 19:12
1,2-Dibromoethane	5.30	U	10.6	3.30	ug/Kg	1		10/12/15 19:12
1,2-Dichlorobenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,2-Dichloroethane	5.30	U	10.6	3.30	ug/Kg	1		10/12/15 19:12
1,2-Dichloropropane	5.30	U	10.6	3.30	ug/Kg	1		10/12/15 19:12
1,3,5-Trimethylbenzene	86.5		26.6	8.30	ug/Kg	1		10/12/15 19:12
1,3-Dichlorobenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
1,3-Dichloropropane	5.30	U	10.6	3.30	ug/Kg	1		10/12/15 19:12
1,4-Dichlorobenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
2,2-Dichloropropane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
2-Butanone (MEK)	133	U	266	83.0	ug/Kg	1		10/12/15 19:12
2-Chlorotoluene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
2-Hexanone	133	U	266	83.0	ug/Kg	1		10/12/15 19:12
4-Chlorotoluene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
4-Isopropyltoluene	14.6	J	26.6	8.30	ug/Kg	1		10/12/15 19:12
4-Methyl-2-pentanone (MIBK)	133	U	266	83.0	ug/Kg	1		10/12/15 19:12
Benzene	23.9		13.3	4.15	ug/Kg	1		10/12/15 19:12
Bromobenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Bromochloromethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Bromodichloromethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Bromoform	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Bromomethane	107	U	213	66.0	ug/Kg	1		10/12/15 19:12
Carbon disulfide	53.0	U	106	33.0	ug/Kg	1		10/12/15 19:12
Carbon tetrachloride	6.65	U	13.3	4.15	ug/Kg	1		10/12/15 19:12
Chlorobenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Chloroethane	107	U	213	66.0	ug/Kg	1		10/12/15 19:12

Results of **093015MW15**

Client Sample ID: **093015MW15**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836008
Lab Project ID: 1155836

Collection Date: 09/30/15 15:30
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.4
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Chloromethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
cis-1,2-Dichloroethene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
cis-1,3-Dichloropropene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Dibromochloromethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Dibromomethane	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Dichlorodifluoromethane	26.6	U	53.2	16.0	ug/Kg	1		10/12/15 19:12
Ethylbenzene	72.6		26.6	8.30	ug/Kg	1		10/12/15 19:12
Freon-113	53.0	U	106	33.0	ug/Kg	1		10/12/15 19:12
Hexachlorobutadiene	26.6	U	53.2	16.0	ug/Kg	1		10/12/15 19:12
Isopropylbenzene (Cumene)	15.7	J	26.6	8.30	ug/Kg	1		10/12/15 19:12
Methylene chloride	53.0	U	106	33.0	ug/Kg	1		10/12/15 19:12
Methyl-t-butyl ether	53.0	U	106	33.0	ug/Kg	1		10/12/15 19:12
Naphthalene	191		53.2	16.0	ug/Kg	1		10/12/15 19:12
n-Butylbenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
n-Propylbenzene	42.6		26.6	8.30	ug/Kg	1		10/12/15 19:12
o-Xylene	57.7		26.6	8.30	ug/Kg	1		10/12/15 19:12
P & M -Xylene	280		53.2	16.0	ug/Kg	1		10/12/15 19:12
sec-Butylbenzene	13.0	J	26.6	8.30	ug/Kg	1		10/12/15 19:12
Styrene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
tert-Butylbenzene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Tetrachloroethene	6.65	U	13.3	4.15	ug/Kg	1		10/12/15 19:12
Toluene	51.3		26.6	8.30	ug/Kg	1		10/12/15 19:12
trans-1,2-Dichloroethene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
trans-1,3-Dichloropropene	13.3	U	26.6	8.30	ug/Kg	1		10/12/15 19:12
Trichloroethene	6.65	U	13.3	4.15	ug/Kg	1		10/12/15 19:12
Trichlorofluoromethane	26.6	U	53.2	16.0	ug/Kg	1		10/12/15 19:12
Vinyl acetate	53.0	U	106	33.0	ug/Kg	1		10/12/15 19:12
Vinyl chloride	5.30	U	10.6	3.30	ug/Kg	1		10/12/15 19:12
Xylenes (total)	337		79.8	24.3	ug/Kg	1		10/12/15 19:12
Surrogates								
1,2-Dichloroethane-D4 (surr)	95.6		71-136		%	1		10/12/15 19:12
4-Bromofluorobenzene (surr)	94.5		55-151		%	1		10/12/15 19:12
Toluene-d8 (surr)	105		85-116		%	1		10/12/15 19:12

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **093015MW15**

Client Sample ID: **093015MW15**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836008
Lab Project ID: 1155836

Collection Date: 09/30/15 15:30
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.4
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Analyst: ST
Analytical Date/Time: 10/12/15 19:12
Container ID: 1155836008-B

Prep Batch: VXX28064
Prep Method: SW5035A
Prep Date/Time: 09/30/15 15:30
Prep Initial Wt./Vol.: 67.532 g
Prep Extract Vol: 32.1353 mL

Results of **093015MW35**

Client Sample ID: **093015MW35**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836009
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	109		88.4	27.4	mg/Kg	4		10/12/15 05:41
Surrogates								
5a Androstane (surr)	96.8		50-150		%	4		10/12/15 05:41

Batch Information

Analytical Batch: XFC12151
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 10/12/15 05:41
Container ID: 1155836009-A

Prep Batch: XXX34370
Prep Method: SW3550C
Prep Date/Time: 10/09/15 12:22
Prep Initial Wt./Vol.: 30.439 g
Prep Extract Vol: 1 mL

Results of **093015MW35**

Client Sample ID: **093015MW35**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836009
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	189		4.57	1.37	mg/Kg	1		10/27/15 18:03
Surrogates								
4-Bromofluorobenzene (surr)	458	*	50-150		%	1		10/27/15 18:03

Batch Information

Analytical Batch: VFC12779
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/27/15 18:03
Container ID: 1155836009-B

Prep Batch: VXX28165
Prep Method: SW5035A
Prep Date/Time: 09/30/15 12:20
Prep Initial Wt./Vol.: 35.327 g
Prep Extract Vol: 28.8174 mL

Results of **093015MW35**

Client Sample ID: **093015MW35**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836009
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,1,1-Trichloroethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,1,2,2-Tetrachloroethane	11.4	U	22.9	7.13	ug/Kg	1		10/12/15 19:28
1,1,2-Trichloroethane	9.15	U	18.3	5.67	ug/Kg	1		10/12/15 19:28
1,1-Dichloroethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,1-Dichloroethene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,1-Dichloropropene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,2,3-Trichlorobenzene	45.8	U	91.5	27.4	ug/Kg	1		10/12/15 19:28
1,2,3-Trichloropropane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,2,4-Trichlorobenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,2,4-Trimethylbenzene	1050		91.5	27.4	ug/Kg	1		10/12/15 19:28
1,2-Dibromo-3-chloropropane	91.5	U	183	56.7	ug/Kg	1		10/12/15 19:28
1,2-Dibromoethane	9.15	U	18.3	5.67	ug/Kg	1		10/12/15 19:28
1,2-Dichlorobenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,2-Dichloroethane	9.15	U	18.3	5.67	ug/Kg	1		10/12/15 19:28
1,2-Dichloropropane	9.15	U	18.3	5.67	ug/Kg	1		10/12/15 19:28
1,3,5-Trimethylbenzene	628		45.7	14.3	ug/Kg	1		10/12/15 19:28
1,3-Dichlorobenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
1,3-Dichloropropane	9.15	U	18.3	5.67	ug/Kg	1		10/12/15 19:28
1,4-Dichlorobenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
2,2-Dichloropropane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
2-Butanone (MEK)	229	U	457	143	ug/Kg	1		10/12/15 19:28
2-Chlorotoluene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
2-Hexanone	229	U	457	143	ug/Kg	1		10/12/15 19:28
4-Chlorotoluene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
4-Isopropyltoluene	182		45.7	14.3	ug/Kg	1		10/12/15 19:28
4-Methyl-2-pentanone (MIBK)	229	U	457	143	ug/Kg	1		10/12/15 19:28
Benzene	14.6	J	22.9	7.13	ug/Kg	1		10/12/15 19:28
Bromobenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Bromochloromethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Bromodichloromethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Bromoform	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Bromomethane	183	U	366	113	ug/Kg	1		10/12/15 19:28
Carbon disulfide	91.5	U	183	56.7	ug/Kg	1		10/12/15 19:28
Carbon tetrachloride	11.4	U	22.9	7.13	ug/Kg	1		10/12/15 19:28
Chlorobenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Chloroethane	183	U	366	113	ug/Kg	1		10/12/15 19:28

Results of **093015MW35**

Client Sample ID: **093015MW35**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836009
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Chloromethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
cis-1,2-Dichloroethene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
cis-1,3-Dichloropropene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Dibromochloromethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Dibromomethane	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Dichlorodifluoromethane	45.8	U	91.5	27.4	ug/Kg	1		10/12/15 19:28
Ethylbenzene	2100		45.7	14.3	ug/Kg	1		10/12/15 19:28
Freon-113	91.5	U	183	56.7	ug/Kg	1		10/12/15 19:28
Hexachlorobutadiene	45.8	U	91.5	27.4	ug/Kg	1		10/12/15 19:28
Isopropylbenzene (Cumene)	64.9		45.7	14.3	ug/Kg	1		10/12/15 19:28
Methylene chloride	91.5	U	183	56.7	ug/Kg	1		10/12/15 19:28
Methyl-t-butyl ether	91.5	U	183	56.7	ug/Kg	1		10/12/15 19:28
Naphthalene	213		91.5	27.4	ug/Kg	1		10/12/15 19:28
n-Butylbenzene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
n-Propylbenzene	128		45.7	14.3	ug/Kg	1		10/12/15 19:28
o-Xylene	1250		457	143	ug/Kg	10		10/13/15 21:13
P & M -Xylene	7700		915	274	ug/Kg	10		10/13/15 21:13
sec-Butylbenzene	30.2	J	45.7	14.3	ug/Kg	1		10/12/15 19:28
Styrene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
tert-Butylbenzene	72.3		45.7	14.3	ug/Kg	1		10/12/15 19:28
Tetrachloroethene	11.4	U	22.9	7.13	ug/Kg	1		10/12/15 19:28
Toluene	38.0	J	45.7	14.3	ug/Kg	1		10/12/15 19:28
trans-1,2-Dichloroethene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
trans-1,3-Dichloropropene	22.9	U	45.7	14.3	ug/Kg	1		10/12/15 19:28
Trichloroethene	11.4	U	22.9	7.13	ug/Kg	1		10/12/15 19:28
Trichlorofluoromethane	45.8	U	91.5	27.4	ug/Kg	1		10/12/15 19:28
Vinyl acetate	91.5	U	183	56.7	ug/Kg	1		10/12/15 19:28
Vinyl chloride	9.15	U	18.3	5.67	ug/Kg	1		10/12/15 19:28
Xylenes (total)	8950		1370	417	ug/Kg	10		10/13/15 21:13
Surrogates								
1,2-Dichloroethane-D4 (surr)	87.2		71-136		%	1		10/12/15 19:28
4-Bromofluorobenzene (surr)	121		55-151		%	1		10/12/15 19:28
Toluene-d8 (surr)	101		85-116		%	1		10/12/15 19:28

Results of **093015MW35**

Client Sample ID: **093015MW35**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836009
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Analyst: ST
Analytical Date/Time: 10/12/15 19:28
Container ID: 1155836009-B

Prep Batch: VXX28064
Prep Method: SW5035A
Prep Date/Time: 09/30/15 12:20
Prep Initial Wt./Vol.: 35.327 g
Prep Extract Vol: 28.8174 mL

Analytical Batch: VMS15333
Analytical Method: SW8260B
Analyst: ST
Analytical Date/Time: 10/13/15 21:13
Container ID: 1155836009-B

Prep Batch: VXX28068
Prep Method: SW5035A
Prep Date/Time: 09/30/15 12:20
Prep Initial Wt./Vol.: 35.327 g
Prep Extract Vol: 28.8174 mL

Results of **100115SS1**

Client Sample ID: **100115SS1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836010
Lab Project ID: 1155836

Collection Date: 10/01/15 11:50
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):86.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	139		91.9	28.5	mg/Kg	4		10/12/15 05:51
Surrogates								
5a Androstane (surr)	106		50-150		%	4		10/12/15 05:51

Batch Information

Analytical Batch: XFC12151
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 10/12/15 05:51
Container ID: 1155836010-A

Prep Batch: XXX34370
Prep Method: SW3550C
Prep Date/Time: 10/09/15 12:22
Prep Initial Wt./Vol.: 30.072 g
Prep Extract Vol: 1 mL

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115SS1**

Client Sample ID: **100115SS1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836010
Lab Project ID: 1155836

Collection Date: 10/01/15 11:50
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):86.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	41.4		3.71	1.11	mg/Kg	1		10/28/15 23:55
Surrogates								
4-Bromofluorobenzene (surr)	126		50-150		%	1		10/28/15 23:55

Batch Information

Analytical Batch: VFC12781
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/28/15 23:55
Container ID: 1155836010-B

Prep Batch: VXX28171
Prep Method: SW5035A
Prep Date/Time: 10/01/15 11:50
Prep Initial Wt./Vol.: 48.844 g
Prep Extract Vol: 31.4339 mL

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115SS1**

Client Sample ID: **100115SS1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836010
Lab Project ID: 1155836

Collection Date: 10/01/15 11:50
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):86.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,1,1-Trichloroethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,1,2,2-Tetrachloroethane	9.25	U	18.5	5.78	ug/Kg	1		10/12/15 19:44
1,1,2-Trichloroethane	7.40	U	14.8	4.60	ug/Kg	1		10/12/15 19:44
1,1-Dichloroethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,1-Dichloroethene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,1-Dichloropropene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,2,3-Trichlorobenzene	37.0	U	74.1	22.2	ug/Kg	1		10/12/15 19:44
1,2,3-Trichloropropane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,2,4-Trichlorobenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,2,4-Trimethylbenzene	433		74.1	22.2	ug/Kg	1		10/12/15 19:44
1,2-Dibromo-3-chloropropane	74.0	U	148	46.0	ug/Kg	1		10/12/15 19:44
1,2-Dibromoethane	7.40	U	14.8	4.60	ug/Kg	1		10/12/15 19:44
1,2-Dichlorobenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,2-Dichloroethane	7.40	U	14.8	4.60	ug/Kg	1		10/12/15 19:44
1,2-Dichloropropane	7.40	U	14.8	4.60	ug/Kg	1		10/12/15 19:44
1,3,5-Trimethylbenzene	208		37.1	11.6	ug/Kg	1		10/12/15 19:44
1,3-Dichlorobenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
1,3-Dichloropropane	7.40	U	14.8	4.60	ug/Kg	1		10/12/15 19:44
1,4-Dichlorobenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
2,2-Dichloropropane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
2-Butanone (MEK)	186	U	371	116	ug/Kg	1		10/12/15 19:44
2-Chlorotoluene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
2-Hexanone	186	U	371	116	ug/Kg	1		10/12/15 19:44
4-Chlorotoluene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
4-Isopropyltoluene	31.1	J	37.1	11.6	ug/Kg	1		10/12/15 19:44
4-Methyl-2-pentanone (MIBK)	186	U	371	116	ug/Kg	1		10/12/15 19:44
Benzene	11.5	J	18.5	5.78	ug/Kg	1		10/12/15 19:44
Bromobenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Bromochloromethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Bromodichloromethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Bromoform	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Bromomethane	148	U	296	91.9	ug/Kg	1		10/12/15 19:44
Carbon disulfide	74.0	U	148	46.0	ug/Kg	1		10/12/15 19:44
Carbon tetrachloride	9.25	U	18.5	5.78	ug/Kg	1		10/12/15 19:44
Chlorobenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Chloroethane	148	U	296	91.9	ug/Kg	1		10/12/15 19:44

Results of **100115SS1**

Client Sample ID: **100115SS1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836010
Lab Project ID: 1155836

Collection Date: 10/01/15 11:50
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):86.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Chloromethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
cis-1,2-Dichloroethene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
cis-1,3-Dichloropropene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Dibromochloromethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Dibromomethane	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Dichlorodifluoromethane	37.0	U	74.1	22.2	ug/Kg	1		10/12/15 19:44
Ethylbenzene	530		37.1	11.6	ug/Kg	1		10/12/15 19:44
Freon-113	74.0	U	148	46.0	ug/Kg	1		10/12/15 19:44
Hexachlorobutadiene	37.0	U	74.1	22.2	ug/Kg	1		10/12/15 19:44
Isopropylbenzene (Cumene)	32.6	J	37.1	11.6	ug/Kg	1		10/12/15 19:44
Methylene chloride	74.0	U	148	46.0	ug/Kg	1		10/12/15 19:44
Methyl-t-butyl ether	74.0	U	148	46.0	ug/Kg	1		10/12/15 19:44
Naphthalene	161		74.1	22.2	ug/Kg	1		10/12/15 19:44
n-Butylbenzene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
n-Propylbenzene	66.3		37.1	11.6	ug/Kg	1		10/12/15 19:44
o-Xylene	305		37.1	11.6	ug/Kg	1		10/12/15 19:44
P & M -Xylene	1640		74.1	22.2	ug/Kg	1		10/12/15 19:44
sec-Butylbenzene	20.0	J	37.1	11.6	ug/Kg	1		10/12/15 19:44
Styrene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
tert-Butylbenzene	25.2	J	37.1	11.6	ug/Kg	1		10/12/15 19:44
Tetrachloroethene	9.25	U	18.5	5.78	ug/Kg	1		10/12/15 19:44
Toluene	14.1	J	37.1	11.6	ug/Kg	1		10/12/15 19:44
trans-1,2-Dichloroethene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
trans-1,3-Dichloropropene	18.6	U	37.1	11.6	ug/Kg	1		10/12/15 19:44
Trichloroethene	9.25	U	18.5	5.78	ug/Kg	1		10/12/15 19:44
Trichlorofluoromethane	37.0	U	74.1	22.2	ug/Kg	1		10/12/15 19:44
Vinyl acetate	74.0	U	148	46.0	ug/Kg	1		10/12/15 19:44
Vinyl chloride	7.40	U	14.8	4.60	ug/Kg	1		10/12/15 19:44
Xylenes (total)	1940		111	33.8	ug/Kg	1		10/12/15 19:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		71-136		%	1		10/12/15 19:44
4-Bromofluorobenzene (surr)	101		55-151		%	1		10/12/15 19:44
Toluene-d8 (surr)	103		85-116		%	1		10/12/15 19:44

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **100115SS1**

Client Sample ID: **100115SS1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836010
Lab Project ID: 1155836

Collection Date: 10/01/15 11:50
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):86.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Analyst: ST
Analytical Date/Time: 10/12/15 19:44
Container ID: 1155836010-B

Prep Batch: VXX28064
Prep Method: SW5035A
Prep Date/Time: 10/01/15 11:50
Prep Initial Wt./Vol.: 48.844 g
Prep Extract Vol: 31.4339 mL

Results of **STB1**

Client Sample ID: **STB1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836011
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.23	U	2.46	0.739	mg/Kg	1		10/28/15 19:48
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		10/28/15 19:48

Batch Information

Analytical Batch: VFC12781
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 10/28/15 19:48
Container ID: 1155836011-A

Prep Batch: VXX28170
Prep Method: SW5035A
Prep Date/Time: 09/30/15 12:20
Prep Initial Wt./Vol.: 50.747 g
Prep Extract Vol: 25 mL

Results of **STB1**

Client Sample ID: **STB1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836011
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,1,1-Trichloroethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,1,2,2-Tetrachloroethane	6.15	U	12.3	3.84	ug/Kg	1		10/13/15 20:09
1,1,2-Trichloroethane	4.92	U	9.85	3.05	ug/Kg	1		10/13/15 20:09
1,1-Dichloroethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,1-Dichloroethene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,1-Dichloropropene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,2,3-Trichlorobenzene	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
1,2,3-Trichloropropane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,2,4-Trichlorobenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,2,4-Trimethylbenzene	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
1,2-Dibromo-3-chloropropane	49.3	U	98.5	30.5	ug/Kg	1		10/13/15 20:09
1,2-Dibromoethane	4.92	U	9.85	3.05	ug/Kg	1		10/13/15 20:09
1,2-Dichlorobenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,2-Dichloroethane	4.92	U	9.85	3.05	ug/Kg	1		10/13/15 20:09
1,2-Dichloropropane	4.92	U	9.85	3.05	ug/Kg	1		10/13/15 20:09
1,3,5-Trimethylbenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,3-Dichlorobenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
1,3-Dichloropropane	4.92	U	9.85	3.05	ug/Kg	1		10/13/15 20:09
1,4-Dichlorobenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
2,2-Dichloropropane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
2-Butanone (MEK)	123	U	246	76.9	ug/Kg	1		10/13/15 20:09
2-Chlorotoluene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
2-Hexanone	123	U	246	76.9	ug/Kg	1		10/13/15 20:09
4-Chlorotoluene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
4-Isopropyltoluene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
4-Methyl-2-pentanone (MIBK)	123	U	246	76.9	ug/Kg	1		10/13/15 20:09
Benzene	6.15	U	12.3	3.84	ug/Kg	1		10/13/15 20:09
Bromobenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Bromochloromethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Bromodichloromethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Bromoform	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Bromomethane	98.5	U	197	61.1	ug/Kg	1		10/13/15 20:09
Carbon disulfide	49.3	U	98.5	30.5	ug/Kg	1		10/13/15 20:09
Carbon tetrachloride	6.15	U	12.3	3.84	ug/Kg	1		10/13/15 20:09
Chlorobenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Chloroethane	98.5	U	197	61.1	ug/Kg	1		10/13/15 20:09

Results of **STB1**

Client Sample ID: **STB1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836011
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Chloromethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
cis-1,2-Dichloroethene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
cis-1,3-Dichloropropene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Dibromochloromethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Dibromomethane	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Dichlorodifluoromethane	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
Ethylbenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Freon-113	49.3	U	98.5	30.5	ug/Kg	1		10/13/15 20:09
Hexachlorobutadiene	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
Isopropylbenzene (Cumene)	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Methylene chloride	49.3	U	98.5	30.5	ug/Kg	1		10/13/15 20:09
Methyl-t-butyl ether	49.3	U	98.5	30.5	ug/Kg	1		10/13/15 20:09
Naphthalene	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
n-Butylbenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
n-Propylbenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
o-Xylene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
P & M -Xylene	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
sec-Butylbenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Styrene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
tert-Butylbenzene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Tetrachloroethene	6.15	U	12.3	3.84	ug/Kg	1		10/13/15 20:09
Toluene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
trans-1,2-Dichloroethene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
trans-1,3-Dichloropropene	12.3	U	24.6	7.69	ug/Kg	1		10/13/15 20:09
Trichloroethene	6.15	U	12.3	3.84	ug/Kg	1		10/13/15 20:09
Trichlorofluoromethane	24.6	U	49.3	14.8	ug/Kg	1		10/13/15 20:09
Vinyl acetate	49.3	U	98.5	30.5	ug/Kg	1		10/13/15 20:09
Vinyl chloride	4.92	U	9.85	3.05	ug/Kg	1		10/13/15 20:09
Xylenes (total)	37.0	U	73.9	22.5	ug/Kg	1		10/13/15 20:09
Surrogates								
1,2-Dichloroethane-D4 (surr)	112		71-136		%	1		10/13/15 20:09
4-Bromofluorobenzene (surr)	101		55-151		%	1		10/13/15 20:09
Toluene-d8 (surr)	113		85-116		%	1		10/13/15 20:09

Print Date: 10/30/2015 11:39:21AM

J flagging is activated

Results of **STB1**

Client Sample ID: **STB1**
Client Project ID: **105.00104.14001 AK Air Kotz GW**
Lab Sample ID: 1155836011
Lab Project ID: 1155836

Collection Date: 09/30/15 12:20
Received Date: 10/05/15 08:44
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS15333
Analytical Method: SW8260B
Analyst: ST
Analytical Date/Time: 10/13/15 20:09
Container ID: 1155836011-A

Prep Batch: VXX28068
Prep Method: SW5035A
Prep Date/Time: 09/30/15 12:20
Prep Initial Wt./Vol.: 50.747 g
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1722181 [SPT/9762]
Blank Lab ID: 1296126

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836008, 1155836009, 1155836010

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9762
Analytical Method: SM21 2540G
Instrument:
Analyst: A.R
Analytical Date/Time: 10/7/2015 5:32:00PM

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

Duplicate Sample Summary

Original Sample ID: 1155851001
Duplicate Sample ID: 1296127
QC for Samples:
1155836008, 1155836009, 1155836010

Analysis Date: 10/07/2015 17:32
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	85.2	85.2	%	0.10	(< 15)

Batch Information

Analytical Batch: SPT9762
Analytical Method: SM21 2540G
Instrument:
Analyst: A.R

Print Date: 10/30/2015 11:39:25AM

Method Blank

Blank ID: MB for HBN 1722586 [VXX/28059]
Blank Lab ID: 1297163

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836006

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	96.8	50-150		%

Batch Information

Analytical Batch: VFC12734
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: KAS
Analytical Date/Time: 10/10/2015 1:05:00AM

Prep Batch: VXX28059
Prep Method: SW5030B
Prep Date/Time: 10/9/2015 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28059]
Blank Spike Lab ID: 1297166
Date Analyzed: 10/10/2015 00:46

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28059]
Spike Duplicate Lab ID: 1297167
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836006

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.09	109	1.00	1.10	110	(60-120)	1.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	107	107	0.0500	102	102	(50-150)	4.80	

Batch Information

Analytical Batch: **VFC12734**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **KAS**

Prep Batch: **VXX28059**
Prep Method: **SW5030B**
Prep Date/Time: **10/09/2015 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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

Method Blank

Blank ID: MB for HBN 1722618 [VXX/28064]
Blank Lab ID: 1297311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836008, 1155836009, 1155836010

Results by **SW8260B**

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

Method Blank

Blank ID: MB for HBN 1722618 [VXX/28064]
Blank Lab ID: 1297311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836008, 1155836009, 1155836010

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	25.0U	50.0	15.0	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	25.0U	50.0	15.0	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	8.50J	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Trichloroethene	6.25U	12.5	3.90	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	105	71-136		%
4-Bromofluorobenzene (surr)	95.4	55-151		%
Toluene-d8 (surr)	111	85-116		%

Method Blank

Blank ID: MB for HBN 1722618 [VXX/28064]
Blank Lab ID: 1297311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836008, 1155836009, 1155836010

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Instrument: VQA 7890/5975 GC/MS
Analyst: ST
Analytical Date/Time: 10/12/2015 4:03:00PM

Prep Batch: VXX28064
Prep Method: SW5035A
Prep Date/Time: 10/12/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28064]
Blank Spike Lab ID: 1297312
Date Analyzed: 10/12/2015 16:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **SW8260B**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)		CL
1,1,1,2-Tetrachloroethane	750	813	108		(78-125)
1,1,1-Trichloroethane	750	905	121		(73-130)
1,1,2,2-Tetrachloroethane	750	715	95		(70-124)
1,1,2-Trichloroethane	750	766	102		(78-121)
1,1-Dichloroethane	750	772	103		(76-125)
1,1-Dichloroethene	750	1150	154	*	(70-131)
1,1-Dichloropropene	750	798	106		(76-125)
1,2,3-Trichlorobenzene	750	1240	165	*	(66-130)
1,2,3-Trichloropropane	750	761	101		(73-125)
1,2,4-Trichlorobenzene	750	999	133	*	(67-129)
1,2,4-Trimethylbenzene	750	765	102		(75-123)
1,2-Dibromo-3-chloropropane	750	874	117		(61-132)
1,2-Dibromoethane	750	819	109		(78-122)
1,2-Dichlorobenzene	750	752	100		(78-121)
1,2-Dichloroethane	750	812	108		(73-128)
1,2-Dichloropropane	750	766	102		(76-123)
1,3,5-Trimethylbenzene	750	749	100		(73-124)
1,3-Dichlorobenzene	750	733	98		(77-121)
1,3-Dichloropropane	750	780	104		(77-121)
1,4-Dichlorobenzene	750	761	101		(75-120)
2,2-Dichloropropane	750	800	107		(67-133)
2-Butanone (MEK)	2250	2170	96		(51-148)
2-Chlorotoluene	750	701	93		(75-122)
2-Hexanone	2250	2350	105		(53-145)
4-Chlorotoluene	750	711	95		(72-124)
4-Isopropyltoluene	750	764	102		(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2200	98		(65-135)
Benzene	750	742	99		(77-121)
Bromobenzene	750	703	94		(78-121)
Bromochloromethane	750	752	100		(78-125)
Bromodichloromethane	750	833	111		(75-127)
Bromoform	750	804	107		(67-132)
Bromomethane	750	1060	141		(53-143)
Carbon disulfide	1130	1720	153	*	(63-132)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28064]
Blank Spike Lab ID: 1297312
Date Analyzed: 10/12/2015 16:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **SW8260B**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)		CL
Carbon tetrachloride	750	857	114		(70-135)
Chlorobenzene	750	713	95		(79-120)
Chloroethane	750	1030	137		(59-139)
Chloroform	750	752	100		(78-123)
Chloromethane	750	812	108		(50-136)
cis-1,2-Dichloroethene	750	717	96		(77-123)
cis-1,3-Dichloropropene	750	843	112		(74-126)
Dibromochloromethane	750	851	113		(74-126)
Dibromomethane	750	792	106		(78-125)
Dichlorodifluoromethane	750	847	113		(29-149)
Ethylbenzene	750	732	98		(76-122)
Freon-113	1130	1570	140	*	(66-136)
Hexachlorobutadiene	750	1080	144	*	(61-135)
Isopropylbenzene (Cumene)	750	726	97		(68-134)
Methylene chloride	750	1030	138	*	(70-128)
Methyl-t-butyl ether	1130	1380	122		(73-125)
Naphthalene	750	871	116		(62-129)
n-Butylbenzene	750	803	107		(70-128)
n-Propylbenzene	750	644	86		(73-125)
o-Xylene	750	683	91		(77-123)
P & M -Xylene	1500	1420	95		(77-124)
sec-Butylbenzene	750	725	97		(73-126)
Styrene	750	645	86		(76-124)
tert-Butylbenzene	750	675	90		(73-125)
Tetrachloroethene	750	721	96		(73-128)
Toluene	750	701	94		(77-121)
trans-1,2-Dichloroethene	750	1040	138	*	(74-125)
trans-1,3-Dichloropropene	750	767	102		(71-130)
Trichloroethene	750	834	111		(77-123)
Trichlorofluoromethane	750	1180	158	*	(62-140)
Vinyl acetate	750	800	107		(50-151)
Vinyl chloride	750	976	130		(56-135)
Xylenes (total)	2250	2110	94		(78-124)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28064]
Blank Spike Lab ID: 1297312
Date Analyzed: 10/12/2015 16:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **SW8260B**

Parameter	Blank Spike (%) Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	107	107	(71-136)
4-Bromofluorobenzene (surr)	750	91.7	92	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS15331**
Analytical Method: **SW8260B**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **ST**

Prep Batch: **VXX28064**
Prep Method: **SW5035A**
Prep Date/Time: **10/12/2015 08:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1297782
MS Sample ID: 1297313 MS
MSD Sample ID: 1297314 MSD

Analysis Date: 10/12/2015 18:56
Analysis Date: 10/12/2015 17:20
Analysis Date: 10/12/2015 17:36
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **SW8260B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	13.1U	783	886	113	783	894	114	78-125	0.85	(< 20)
1,1,1-Trichloroethane	13.1U	783	868	111	783	905	116	73-130	4.20	(< 20)
1,1,2,2-Tetrachloroethane	6.55U	783	706	90	783	784	100	70-124	10.50	(< 20)
1,1,2-Trichloroethane	5.20U	783	809	103	783	840	107	78-121	3.80	(< 20)
1,1-Dichloroethane	13.1U	783	860	110	783	777	99	76-125	10.20	(< 20)
1,1-Dichloroethene	13.1U	783	934	119	783	1180	151 *	70-131	23.30	* (< 20)
1,1-Dichloropropene	13.1U	783	832	106	783	811	104	76-125	2.60	(< 20)
1,2,3-Trichlorobenzene	26.1U	783	991	127	783	1250	159 *	66-130	22.80	* (< 20)
1,2,3-Trichloropropane	13.1U	783	741	95	783	839	107	73-125	12.40	(< 20)
1,2,4-Trichlorobenzene	13.1U	783	932	119	783	1180	151 *	67-129	23.60	* (< 20)
1,2,4-Trimethylbenzene	26.1U	783	795	102	783	897	115	75-123	12.00	(< 20)
1,2-Dibromo-3-chloropropane	52.0U	783	801	102	783	1040	132	61-132	25.60	* (< 20)
1,2-Dibromoethane	5.20U	783	858	110	783	848	108	78-122	1.20	(< 20)
1,2-Dichlorobenzene	13.1U	783	766	98	783	778	99	78-121	1.60	(< 20)
1,2-Dichloroethane	5.20U	783	760	97	783	804	103	73-128	5.60	(< 20)
1,2-Dichloropropane	5.20U	783	636	81	783	763	97	76-123	18.10	(< 20)
1,3,5-Trimethylbenzene	13.1U	783	803	103	783	894	114	73-124	10.70	(< 20)
1,3-Dichlorobenzene	13.1U	783	713	91	783	824	105	77-121	14.50	(< 20)
1,3-Dichloropropane	5.20U	783	831	106	783	841	107	77-121	1.20	(< 20)
1,4-Dichlorobenzene	13.1U	783	729	93	783	859	110	75-120	16.40	(< 20)
2,2-Dichloropropane	13.1U	783	793	101	783	805	103	67-133	1.60	(< 20)
2-Butanone (MEK)	131U	2350	2150	92	2350	2240	95	51-148	3.80	(< 20)
2-Chlorotoluene	13.1U	783	752	96	783	852	109	75-122	12.40	(< 20)
2-Hexanone	131U	2350	2230	95	2350	2350	100	53-145	5.40	(< 20)
4-Chlorotoluene	13.1U	783	747	95	783	1010	129 *	72-124	30.30	* (< 20)
4-Isopropyltoluene	13.1U	783	725	93	783	767	98	73-127	5.60	(< 20)
4-Methyl-2-pentanone (MIBK)	131U	2350	1600	68	2350	2280	97	65-135	35.20	* (< 20)
Benzene	6.55U	783	848	108	783	767	98	77-121	10.00	(< 20)
Bromobenzene	13.1U	783	753	96	783	922	118	78-121	20.20	* (< 20)
Bromochloromethane	13.1U	783	810	103	783	734	94	78-125	9.80	(< 20)
Bromodichloromethane	13.1U	783	692	88	783	855	109	75-127	21.00	* (< 20)
Bromoform	13.1U	783	889	114	783	905	116	67-132	1.80	(< 20)
Bromomethane	105U	783	839	107	783	1060	135	53-143	23.00	* (< 20)
Carbon disulfide	52.0U	1170	1370	117	1170	1750	149 *	63-132	24.50	* (< 20)
Carbon tetrachloride	6.55U	783	815	104	783	855	109	70-135	4.80	(< 20)
Chlorobenzene	13.1U	783	785	100	783	791	101	79-120	0.76	(< 20)
Chloroethane	105U	783	791	101	783	1020	130	59-139	25.30	* (< 20)

Print Date: 10/30/2015 11:39:38AM

Matrix Spike Summary

Original Sample ID: 1297782
MS Sample ID: 1297313 MS
MSD Sample ID: 1297314 MSD

Analysis Date: 10/12/2015 18:56
Analysis Date: 10/12/2015 17:20
Analysis Date: 10/12/2015 17:36
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **SW8260B**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Chloroform	13.1U	783	771	98		783	763	97		78-123	0.99	(< 20)
Chloromethane	13.1U	783	699	89		783	752	96		50-136	7.30	(< 20)
cis-1,2-Dichloroethene	13.1U	783	819	105		783	737	94		77-123	10.50	(< 20)
cis-1,3-Dichloropropene	13.1U	783	634	81		783	859	110		74-126	30.10	* (< 20)
Dibromochloromethane	13.1U	783	894	114		783	887	113		74-126	0.73	(< 20)
Dibromomethane	13.1U	783	630	80		783	790	101		78-125	22.50	* (< 20)
Dichlorodifluoromethane	26.1U	783	557	71		783	678	87		29-149	19.60	(< 20)
Ethylbenzene	13.1U	783	792	101		783	794	101		76-122	0.23	(< 20)
Freon-113	52.0U	1170	1310	112		1170	1680	143	*	66-136	24.40	* (< 20)
Hexachlorobutadiene	26.1U	783	1080	138	*	783	1150	147	*	61-135	6.50	(< 20)
Isopropylbenzene (Cumene)	13.1U	783	886	113		783	923	118		68-134	4.10	(< 20)
Methylene chloride	52.0U	783	888	113		783	1030	131	*	70-128	14.70	(< 20)
Methyl-t-butyl ether	52.0U	1170	1350	115		1170	1390	119		73-125	3.50	(< 20)
Naphthalene	26.1U	783	852	109		783	1210	154	*	62-129	34.60	* (< 20)
n-Butylbenzene	13.1U	783	823	105		783	897	115		70-128	8.60	(< 20)
n-Propylbenzene	13.1U	783	711	91		783	778	99		73-125	8.90	(< 20)
o-Xylene	13.1U	783	797	102		783	791	101		77-123	0.72	(< 20)
P & M -Xylene	26.1U	1570	1590	101		1570	1580	101		77-124	0.20	(< 20)
sec-Butylbenzene	13.1U	783	753	96		783	827	106		73-126	9.40	(< 20)
Styrene	13.1U	783	739	94		783	751	96		76-124	1.60	(< 20)
tert-Butylbenzene	13.1U	783	726	93		783	802	102		73-125	9.90	(< 20)
Tetrachloroethene	6.55U	783	798	102		783	798	102		73-128	0.03	(< 20)
Toluene	13.1U	783	793	101		783	800	102		77-121	0.89	(< 20)
trans-1,2-Dichloroethene	13.1U	783	904	115		783	1080	137	*	74-125	17.40	(< 20)
trans-1,3-Dichloropropene	13.1U	783	848	108		783	856	109		71-130	0.86	(< 20)
Trichloroethene	6.55U	783	766	98		783	836	107		77-123	8.80	(< 20)
Trichlorofluoromethane	26.1U	783	935	119		783	1010	129		62-140	7.30	(< 20)
Vinyl acetate	52.0U	783	896	114		783	826	105		50-151	8.20	(< 20)
Vinyl chloride	5.20U	783	858	110		783	898	115		56-135	4.60	(< 20)
Xylenes (total)	39.1U	2350	2380	101		2350	2380	101		78-124	0.37	(< 20)
Surrogates												
1,2-Dichloroethane-D4 (surr)		783	774	99		783	811	104		71-136	4.60	
4-Bromofluorobenzene (surr)		2090	1660	79		2090	1730	83		55-151	4.10	
Toluene-d8 (surr)		783	838	107		783	845	108		85-116	0.84	

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Matrix Spike Summary

Original Sample ID: 1297782
MS Sample ID: 1297313 MS
MSD Sample ID: 1297314 MSD

Analysis Date:
Analysis Date: 10/12/2015 17:20
Analysis Date: 10/12/2015 17:36
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **SW8260B**

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

Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Instrument: VQA 7890/5975 GC/MS
Analyst: ST
Analytical Date/Time: 10/12/2015 5:20:00PM

Prep Batch: VXX28064
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/12/2015 8:00:01AM
Prep Initial Wt./Vol.: 47.88g
Prep Extract Vol: 25.00mL

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Method Blank

Blank ID: MB for HBN 1722626 [VXX/28066]
Blank Lab ID: 1297344

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.500U	1.00	0.310	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	5.00U	10.0	3.10	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.300	ug/L

Method Blank

Blank ID: MB for HBN 1722626 [VXX/28066]
Blank Lab ID: 1297344

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	5.00U	10.0	3.10	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	110	81-118		%
4-Bromofluorobenzene (surr)	99	85-114		%
Toluene-d8 (surr)	98.4	89-112		%

Method Blank

Blank ID: MB for HBN 1722626 [VXX/28066]
Blank Lab ID: 1297344

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Instrument: HP 5890 Series II MS3 VNA
Analyst: SCL
Analytical Date/Time: 10/9/2015 11:00:00AM

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/9/2015 8:59:41AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1722626 [VXX/28066]
Blank Lab ID: 1297347

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.500U	1.00	0.310	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	5.00U	10.0	3.10	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.300	ug/L

Method Blank

Blank ID: MB for HBN 1722626 [VXX/28066]
Blank Lab ID: 1297347

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	5.00U	10.0	3.10	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	109	81-118		%
4-Bromofluorobenzene (surr)	107	85-114		%
Toluene-d8 (surr)	99.8	89-112		%

Method Blank

Blank ID: MB for HBN 1722626 [VXX/28066]
Blank Lab ID: 1297347

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS15328
Analytical Method: SW8260B
Instrument: HP 5890 Series II MS3 VNA
Analyst: SCL
Analytical Date/Time: 10/9/2015 7:06:00PM

Prep Batch: VXX28066
Prep Method: SW5030B
Prep Date/Time: 10/9/2015 8:59:41AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28066]
Blank Spike Lab ID: 1297345
Date Analyzed: 10/09/2015 11:33

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28066]
Spike Duplicate Lab ID: 1297346
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	28.7	96	30	29.1	97	(78-124)	1.60	(< 20)
1,1,1-Trichloroethane	30	30.7	102	30	28.9	96	(74-131)	6.20	(< 20)
1,1,2,2-Tetrachloroethane	30	27.4	91	30	29.9	100	(71-121)	8.60	(< 20)
1,1,2-Trichloroethane	30	32.5	108	30	33.4	111	(80-119)	2.60	(< 20)
1,1-Dichloroethane	30	31.8	106	30	30.9	103	(77-125)	2.80	(< 20)
1,1-Dichloroethene	30	30.2	101	30	28.8	96	(71-131)	4.90	(< 20)
1,1-Dichloropropene	30	31.9	106	30	29.4	98	(79-125)	8.00	(< 20)
1,2,3-Trichlorobenzene	30	27.9	93	30	30.9	103	(69-129)	10.30	(< 20)
1,2,3-Trichloropropane	30	27.3	91	30	29.2	97	(73-122)	6.70	(< 20)
1,2,4-Trichlorobenzene	30	27.7	92	30	30.9	103	(69-130)	11.10	(< 20)
1,2,4-Trimethylbenzene	30	29.2	97	30	30.0	100	(79-124)	2.70	(< 20)
1,2-Dibromo-3-chloropropane	30	29.4	98	30	33.1	110	(62-128)	11.80	(< 20)
1,2-Dibromoethane	30	33.0	110	30	33.5	112	(77-121)	1.70	(< 20)
1,2-Dichlorobenzene	30	29.0	97	30	31.0	103	(80-119)	6.70	(< 20)
1,2-Dichloroethane	30	31.0	103	30	30.7	102	(73-128)	1.10	(< 20)
1,2-Dichloropropane	30	33.2	111	30	31.2	104	(78-122)	6.40	(< 20)
1,3,5-Trimethylbenzene	30	28.7	96	30	29.8	99	(75-124)	3.70	(< 20)
1,3-Dichlorobenzene	30	30.1	100	30	31.2	104	(80-119)	3.50	(< 20)
1,3-Dichloropropane	30	32.6	109	30	33.8	113	(80-119)	3.60	(< 20)
1,4-Dichlorobenzene	30	30.1	100	30	31.4	105	(79-118)	4.30	(< 20)
2,2-Dichloropropane	30	33.4	111	30	33.4	111	(60-139)	0.15	(< 20)
2-Butanone (MEK)	90	101	113	90	107	119	(56-143)	5.90	(< 20)
2-Chlorotoluene	30	31.5	105	30	33.0	110	(79-122)	4.70	(< 20)
2-Hexanone	90	93.2	104	90	97.6	108	(57-139)	4.50	(< 20)
4-Chlorotoluene	30	32.3	108	30	33.0	110	(78-122)	2.10	(< 20)
4-Isopropyltoluene	30	28.7	96	30	30.7	102	(77-127)	7.00	(< 20)
4-Methyl-2-pentanone (MIBK)	90	92.1	102	90	92.2	102	(67-130)	0.09	(< 20)
Benzene	30	35.0	117	30	34.0	113	(79-120)	2.90	(< 20)
Bromobenzene	30	29.1	97	30	30.6	102	(80-120)	5.00	(< 20)
Bromochloromethane	30	30.2	101	30	30.9	103	(78-123)	2.40	(< 20)
Bromodichloromethane	30	32.6	109	30	30.3	101	(79-125)	7.50	(< 20)
Bromoform	30	28.6	95	30	28.6	95	(66-130)	0.07	(< 20)
Bromomethane	30	26.5	88	30	28.9	96	(53-141)	8.70	(< 20)
Carbon disulfide	45	48.6	108	45	49.1	109	(64-133)	0.98	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28066]
Blank Spike Lab ID: 1297345
Date Analyzed: 10/09/2015 11:33

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28066]
Spike Duplicate Lab ID: 1297346
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	31.2	104	30	29.7	99	(72-136)	5.10	(< 20)
Chlorobenzene	30	32.3	108	30	31.3	104	(82-118)	3.40	(< 20)
Chloroethane	30	29.7	99	30	29.2	97	(60-138)	1.50	(< 20)
Chloroform	30	32.0	107	30	31.1	104	(79-124)	3.00	(< 20)
Chloromethane	30	27.9	93	30	30.2	101	(50-139)	8.00	(< 20)
cis-1,2-Dichloroethene	30	31.8	106	30	31.1	104	(78-123)	2.20	(< 20)
cis-1,3-Dichloropropene	30	30.4	101	30	28.9	96	(75-124)	5.20	(< 20)
Dibromochloromethane	30	29.3	98	30	29.3	98	(74-126)	0.07	(< 20)
Dibromomethane	30	31.2	104	30	31.0	103	(79-123)	0.48	(< 20)
Dichlorodifluoromethane	30	33.8	113	30	33.8	113	(32-152)	0.03	(< 20)
Ethylbenzene	30	31.1	104	30	31.1	104	(79-121)	0.13	(< 20)
Freon-113	45	51.4	114	45	51.8	115	(70-136)	0.85	(< 20)
Hexachlorobutadiene	30	28.9	97	30	31.2	104	(66-134)	7.50	(< 20)
Isopropylbenzene (Cumene)	30	32.8	109	30	31.0	103	(72-131)	5.70	(< 20)
Methylene chloride	30	31.5	105	30	30.8	103	(74-124)	2.40	(< 20)
Methyl-t-butyl ether	45	46.0	102	45	45.5	101	(71-124)	1.20	(< 20)
Naphthalene	30	27.9	93	30	31.6	105	(61-128)	12.50	(< 20)
n-Butylbenzene	30	29.2	97	30	31.4	105	(75-128)	7.40	(< 20)
n-Propylbenzene	30	32.7	109	30	33.6	112	(76-126)	2.60	(< 20)
o-Xylene	30	30.6	102	30	29.8	99	(78-122)	2.60	(< 20)
P & M -Xylene	60	63.6	106	60	61.6	103	(80-121)	3.20	(< 20)
sec-Butylbenzene	30	30.1	100	30	31.4	105	(77-126)	4.30	(< 20)
Styrene	30	31.2	104	30	30.6	102	(78-123)	2.00	(< 20)
tert-Butylbenzene	30	28.5	95	30	30.4	101	(78-124)	6.30	(< 20)
Tetrachloroethene	30	32.8	109	30	33.0	110	(74-129)	0.73	(< 20)
Toluene	30	32.2	107	30	31.3	104	(80-121)	2.80	(< 20)
trans-1,2-Dichloroethene	30	30.7	102	30	30.9	103	(75-124)	0.71	(< 20)
trans-1,3-Dichloropropene	30	30.5	102	30	31.6	105	(73-127)	3.60	(< 20)
Trichloroethene	30	30.4	101	30	30.0	100	(79-123)	1.30	(< 20)
Trichlorofluoromethane	30	33.0	110	30	34.8	116	(65-141)	5.40	(< 20)
Vinyl acetate	30	32.3	108	30	32.8	109	(54-146)	1.30	(< 20)
Vinyl chloride	30	32.8	109	30	34.4	115	(58-137)	4.80	(< 20)
Xylenes (total)	90	94.2	105	90	91.4	102	(79-121)	3.00	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28066]
Blank Spike Lab ID: 1297345
Date Analyzed: 10/09/2015 11:33

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28066]
Spike Duplicate Lab ID: 1297346
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

	Blank Spike (%)			Spike Duplicate (%)				
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	104	104	30	101	101	(81-118)	2.70	
4-Bromofluorobenzene (surr)	30	96	96	30	98.2	98	(85-114)	2.30	
Toluene-d8 (surr)	30	102	102	30	100	100	(89-112)	2.30	

Batch Information

Analytical Batch: **VMS15328**
Analytical Method: **SW8260B**
Instrument: **HP 5890 Series II MS3 VNA**
Analyst: **SCL**

Prep Batch: **VXX28066**
Prep Method: **SW5030B**
Prep Date/Time: **10/09/2015 08:59**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28066]
Blank Spike Lab ID: 1297348
Date Analyzed: 10/09/2015 19:40

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28066]
Spike Duplicate Lab ID: 1297349
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	29.4	98	30	27.4	91	(78-124)	7.10	(< 20)
1,1,1-Trichloroethane	30	30.4	101	30	29.7	99	(74-131)	2.30	(< 20)
1,1,2,2-Tetrachloroethane	30	29.9	100	30	30.2	101	(71-121)	0.83	(< 20)
1,1,2-Trichloroethane	30	31.8	106	30	32.1	107	(80-119)	0.78	(< 20)
1,1-Dichloroethane	30	29.3	98	30	31.2	104	(77-125)	6.30	(< 20)
1,1-Dichloroethene	30	26.1	87	30	26.8	89	(71-131)	2.60	(< 20)
1,1-Dichloropropene	30	31.1	104	30	31.1	104	(79-125)	0.23	(< 20)
1,2,3-Trichlorobenzene	30	29.4	98	30	31.7	106	(69-129)	7.60	(< 20)
1,2,3-Trichloropropane	30	28.6	95	30	28.5	95	(73-122)	0.28	(< 20)
1,2,4-Trichlorobenzene	30	28.0	93	30	29.2	97	(69-130)	4.00	(< 20)
1,2,4-Trimethylbenzene	30	28.5	95	30	28.6	95	(79-124)	0.49	(< 20)
1,2-Dibromo-3-chloropropane	30	30.2	101	30	34.2	114	(62-128)	12.40	(< 20)
1,2-Dibromoethane	30	32.9	110	30	33.4	111	(77-121)	1.50	(< 20)
1,2-Dichlorobenzene	30	30.0	100	30	29.8	99	(80-119)	0.57	(< 20)
1,2-Dichloroethane	30	31.8	106	30	31.3	104	(73-128)	1.60	(< 20)
1,2-Dichloropropane	30	32.8	109	30	32.0	107	(78-122)	2.50	(< 20)
1,3,5-Trimethylbenzene	30	28.6	96	30	28.2	94	(75-124)	1.40	(< 20)
1,3-Dichlorobenzene	30	30.0	100	30	29.7	99	(80-119)	0.80	(< 20)
1,3-Dichloropropane	30	33.1	110	30	33.3	111	(80-119)	0.57	(< 20)
1,4-Dichlorobenzene	30	29.5	98	30	31.1	104	(79-118)	5.10	(< 20)
2,2-Dichloropropane	30	28.8	96	30	30.2	101	(60-139)	4.60	(< 20)
2-Butanone (MEK)	90	109	122	90	122	136	(56-143)	11.30	(< 20)
2-Chlorotoluene	30	31.3	104	30	32.2	107	(79-122)	2.80	(< 20)
2-Hexanone	90	97.7	109	90	101	112	(57-139)	3.30	(< 20)
4-Chlorotoluene	30	31.2	104	30	31.2	104	(78-122)	0.06	(< 20)
4-Isopropyltoluene	30	28.9	97	30	28.6	95	(77-127)	1.30	(< 20)
4-Methyl-2-pentanone (MIBK)	90	94.5	105	90	99.2	110	(67-130)	4.80	(< 20)
Benzene	30	35.1	117	30	34.9	116	(79-120)	0.37	(< 20)
Bromobenzene	30	27.9	93	30	28.1	94	(80-120)	0.68	(< 20)
Bromochloromethane	30	30.7	102	30	32.3	108	(78-123)	5.20	(< 20)
Bromodichloromethane	30	33.2	111	30	32.2	107	(79-125)	2.80	(< 20)
Bromoform	30	30.3	101	30	28.4	95	(66-130)	6.20	(< 20)
Bromomethane	30	24.7	82	30	25.2	84	(53-141)	2.00	(< 20)
Carbon disulfide	45	44.1	98	45	43.2	96	(64-133)	2.10	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28066]
Blank Spike Lab ID: 1297348
Date Analyzed: 10/09/2015 19:40

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28066]
Spike Duplicate Lab ID: 1297349
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	32.0	107	30	30.9	103	(72-136)	3.50	(< 20)
Chlorobenzene	30	31.6	105	30	30.8	103	(82-118)	2.60	(< 20)
Chloroethane	30	28.4	95	30	26.7	89	(60-138)	6.20	(< 20)
Chloroform	30	31.6	105	30	31.6	105	(79-124)	0.10	(< 20)
Chloromethane	30	27.7	92	30	29.9	100	(50-139)	7.60	(< 20)
cis-1,2-Dichloroethene	30	32.4	108	30	31.3	104	(78-123)	3.60	(< 20)
cis-1,3-Dichloropropene	30	29.3	98	30	28.5	95	(75-124)	2.80	(< 20)
Dibromochloromethane	30	29.5	98	30	28.6	95	(74-126)	3.10	(< 20)
Dibromomethane	30	31.5	105	30	30.5	102	(79-123)	3.10	(< 20)
Dichlorodifluoromethane	30	32.4	108	30	34.4	115	(32-152)	6.10	(< 20)
Ethylbenzene	30	32.0	107	30	30.0	100	(79-121)	6.50	(< 20)
Freon-113	45	46.7	104	45	46.0	102	(70-136)	1.30	(< 20)
Hexachlorobutadiene	30	29.6	99	30	29.6	99	(66-134)	0.00	(< 20)
Isopropylbenzene (Cumene)	30	31.6	105	30	29.7	99	(72-131)	6.40	(< 20)
Methylene chloride	30	32.0	107	30	31.7	106	(74-124)	0.85	(< 20)
Methyl-t-butyl ether	45	46.0	102	45	45.6	101	(71-124)	0.98	(< 20)
Naphthalene	30	30.6	102	30	31.5	105	(61-128)	2.60	(< 20)
n-Butylbenzene	30	28.9	96	30	28.3	94	(75-128)	2.10	(< 20)
n-Propylbenzene	30	32.7	109	30	32.3	108	(76-126)	1.20	(< 20)
o-Xylene	30	30.5	102	30	29.7	99	(78-122)	2.60	(< 20)
P & M -Xylene	60	62.5	104	60	58.9	98	(80-121)	5.90	(< 20)
sec-Butylbenzene	30	29.9	100	30	29.9	100	(77-126)	0.17	(< 20)
Styrene	30	30.6	102	30	29.4	98	(78-123)	3.90	(< 20)
tert-Butylbenzene	30	28.7	96	30	28.7	96	(78-124)	0.10	(< 20)
Tetrachloroethene	30	33.0	110	30	32.5	108	(74-129)	1.30	(< 20)
Toluene	30	32.4	108	30	30.6	102	(80-121)	5.60	(< 20)
trans-1,2-Dichloroethene	30	29.1	97	30	30.8	103	(75-124)	5.50	(< 20)
trans-1,3-Dichloropropene	30	29.2	98	30	28.0	94	(73-127)	4.20	(< 20)
Trichloroethene	30	31.7	106	30	30.0	100	(79-123)	5.60	(< 20)
Trichlorofluoromethane	30	34.6	115	30	34.0	113	(65-141)	1.70	(< 20)
Vinyl acetate	30	30.9	103	30	31.4	105	(54-146)	1.80	(< 20)
Vinyl chloride	30	31.3	104	30	32.3	108	(58-137)	3.20	(< 20)
Xylenes (total)	90	93.0	103	90	88.6	99	(79-121)	4.80	(< 20)

SGS North America Inc.
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t 907.562.2343 f 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28066]
Blank Spike Lab ID: 1297348
Date Analyzed: 10/09/2015 19:40

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28066]
Spike Duplicate Lab ID: 1297349
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004, 1155836007

Results by **SW8260B**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	102	102	30	98.9	99	(81-118)	3.00	
4-Bromofluorobenzene (surr)	30	92.2	92	30	97.1	97	(85-114)	5.20	
Toluene-d8 (surr)	30	99.5	100	30	102	102	(89-112)	2.60	

Batch Information

Analytical Batch: **VMS15328**
Analytical Method: **SW8260B**
Instrument: **HP 5890 Series II MS3 VNA**
Analyst: **SCL**

Prep Batch: **VXX28066**
Prep Method: **SW5030B**
Prep Date/Time: **10/09/2015 08:59**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1722671 [VXX/28068]
Blank Lab ID: 1297572

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836009, 1155836011

Results by **SW8260B**

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

Method Blank

Blank ID: MB for HBN 1722671 [VXX/28068]
Blank Lab ID: 1297572

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836009, 1155836011

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	25.0U	50.0	15.0	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	25.0U	50.0	15.0	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Trichloroethene	6.25U	12.5	3.90	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	106	71-136		%
4-Bromofluorobenzene (surr)	96.9	55-151		%
Toluene-d8 (surr)	105	85-116		%

Method Blank

Blank ID: MB for HBN 1722671 [VXX/28068]
Blank Lab ID: 1297572

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836009, 1155836011

Results by **SW8260B**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS15333
Analytical Method: SW8260B
Instrument: Agilent 7890-75MS
Analyst: ST
Analytical Date/Time: 10/13/2015 5:41:00PM

Prep Batch: VXX28068
Prep Method: SW5035A
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28068]
Blank Spike Lab ID: 1297573
Date Analyzed: 10/13/2015 18:11

Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836009, 1155836011

Results by **SW8260B**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	796	106	(78-125)
1,1,1-Trichloroethane	750	840	112	(73-130)
1,1,2,2-Tetrachloroethane	750	773	103	(70-124)
1,1,2-Trichloroethane	750	785	105	(78-121)
1,1-Dichloroethane	750	765	102	(76-125)
1,1-Dichloroethene	750	847	113	(70-131)
1,1-Dichloropropene	750	770	103	(76-125)
1,2,3-Trichlorobenzene	750	677	90	(66-130)
1,2,3-Trichloropropane	750	747	100	(73-125)
1,2,4-Trichlorobenzene	750	722	96	(67-129)
1,2,4-Trimethylbenzene	750	801	107	(75-123)
1,2-Dibromo-3-chloropropane	750	739	99	(61-132)
1,2-Dibromoethane	750	803	107	(78-122)
1,2-Dichlorobenzene	750	751	100	(78-121)
1,2-Dichloroethane	750	733	98	(73-128)
1,2-Dichloropropane	750	772	103	(76-123)
1,3,5-Trimethylbenzene	750	807	108	(73-124)
1,3-Dichlorobenzene	750	752	100	(77-121)
1,3-Dichloropropane	750	783	104	(77-121)
1,4-Dichlorobenzene	750	764	102	(75-120)
2,2-Dichloropropane	750	832	111	(67-133)
2-Butanone (MEK)	2250	2070	92	(51-148)
2-Chlorotoluene	750	788	105	(75-122)
2-Hexanone	2250	2210	98	(53-145)
4-Chlorotoluene	750	778	104	(72-124)
4-Isopropyltoluene	750	832	111	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2100	93	(65-135)
Benzene	750	772	103	(77-121)
Bromobenzene	750	783	104	(78-121)
Bromochloromethane	750	742	99	(78-125)
Bromodichloromethane	750	800	107	(75-127)
Bromoform	750	705	94	(67-132)
Bromomethane	750	886	118	(53-143)
Carbon disulfide	1130	1260	112	(63-132)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28068]
Blank Spike Lab ID: 1297573
Date Analyzed: 10/13/2015 18:11

Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836009, 1155836011

Results by **SW8260B**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon tetrachloride	750	774	103	(70-135)
Chlorobenzene	750	766	102	(79-120)
Chloroethane	750	837	112	(59-139)
Chloroform	750	726	97	(78-123)
Chloromethane	750	942	126	(50-136)
cis-1,2-Dichloroethene	750	750	100	(77-123)
cis-1,3-Dichloropropene	750	806	108	(74-126)
Dibromochloromethane	750	720	96	(74-126)
Dibromomethane	750	708	94	(78-125)
Dichlorodifluoromethane	750	989	132	(29-149)
Ethylbenzene	750	787	105	(76-122)
Freon-113	1130	1180	105	(66-136)
Hexachlorobutadiene	750	850	113	(61-135)
Isopropylbenzene (Cumene)	750	809	108	(68-134)
Methylene chloride	750	738	98	(70-128)
Methyl-t-butyl ether	1130	1160	103	(73-125)
Naphthalene	750	656	87	(62-129)
n-Butylbenzene	750	753	100	(70-128)
n-Propylbenzene	750	818	109	(73-125)
o-Xylene	750	765	102	(77-123)
P & M -Xylene	1500	1560	104	(77-124)
sec-Butylbenzene	750	756	101	(73-126)
Styrene	750	788	105	(76-124)
tert-Butylbenzene	750	820	109	(73-125)
Tetrachloroethene	750	819	109	(73-128)
Toluene	750	769	102	(77-121)
trans-1,2-Dichloroethene	750	779	104	(74-125)
trans-1,3-Dichloropropene	750	717	96	(71-130)
Trichloroethene	750	814	109	(77-123)
Trichlorofluoromethane	750	890	119	(62-140)
Vinyl acetate	750	828	110	(50-151)
Vinyl chloride	750	903	120	(56-135)
Xylenes (total)	2250	2330	103	(78-124)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28068]
Blank Spike Lab ID: 1297573
Date Analyzed: 10/13/2015 18:11

Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836009, 1155836011

Results by **SW8260B**

Parameter	Blank Spike (%) Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	98.7	99	(71-136)
4-Bromofluorobenzene (surr)	750	99.8	100	(55-151)
Toluene-d8 (surr)	750	106	106	(85-116)

Batch Information

Analytical Batch: **VMS15333**
Analytical Method: **SW8260B**
Instrument: **Agilent 7890-75MS**
Analyst: **ST**

Prep Batch: **VXX28068**
Prep Method: **SW5035A**
Prep Date/Time: **10/13/2015 08:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1297574
MS Sample ID: 1297575 MS
MSD Sample ID: 1297576 MSD

Analysis Date: 10/13/2015 20:57
Analysis Date: 10/13/2015 18:50
Analysis Date: 10/13/2015 19:06
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1155836009, 1155836011

Results by **SW8260B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	12.2U	728	804	110	728	824	113	78-125	2.40	(< 20)
1,1,1-Trichloroethane	12.2U	728	841	115	728	831	114	73-130	1.20	(< 20)
1,1,2,2-Tetrachloroethane	6.05U	728	743	102	728	776	106	70-124	4.40	(< 20)
1,1,2-Trichloroethane	4.86U	728	784	108	728	795	109	78-121	1.40	(< 20)
1,1-Dichloroethane	12.2U	728	764	105	728	754	104	76-125	1.30	(< 20)
1,1-Dichloroethene	12.2U	728	840	115	728	826	113	70-131	1.70	(< 20)
1,1-Dichloropropene	12.2U	728	763	105	728	765	105	76-125	0.22	(< 20)
1,2,3-Trichlorobenzene	24.3U	728	660	91	728	814	112	66-130	20.90	* (< 20)
1,2,3-Trichloropropane	12.2U	728	728	100	728	755	104	73-125	3.50	(< 20)
1,2,4-Trichlorobenzene	12.2U	728	696	96	728	792	109	67-129	12.90	(< 20)
1,2,4-Trimethylbenzene	29.6J	728	807	107	728	812	107	75-123	0.57	(< 20)
1,2-Dibromo-3-chloropropane	48.5U	728	737	101	728	828	114	61-132	11.60	(< 20)
1,2-Dibromoethane	4.86U	728	801	110	728	822	113	78-122	2.70	(< 20)
1,2-Dichlorobenzene	12.2U	728	730	100	728	738	101	78-121	1.00	(< 20)
1,2-Dichloroethane	4.86U	728	733	101	728	723	99	73-128	1.30	(< 20)
1,2-Dichloropropane	4.86U	728	774	106	728	772	106	76-123	0.22	(< 20)
1,3,5-Trimethylbenzene	11.2J	728	786	106	728	799	108	73-124	1.70	(< 20)
1,3-Dichlorobenzene	12.2U	728	723	99	728	735	101	77-121	1.70	(< 20)
1,3-Dichloropropane	4.86U	728	785	108	728	800	110	77-121	2.00	(< 20)
1,4-Dichlorobenzene	12.2U	728	747	103	728	751	103	75-120	0.52	(< 20)
2,2-Dichloropropane	12.2U	728	826	113	728	810	111	67-133	1.90	(< 20)
2-Butanone (MEK)	122U	2190	2030	93	2190	2230	102	51-148	9.40	(< 20)
2-Chlorotoluene	12.2U	728	764	105	728	775	106	75-122	1.50	(< 20)
2-Hexanone	122U	2190	2160	99	2190	2310	106	53-145	6.50	(< 20)
4-Chlorotoluene	12.2U	728	754	104	728	776	106	72-124	2.80	(< 20)
4-Isopropyltoluene	12.2U	728	823	113	728	815	112	73-127	1.00	(< 20)
4-Methyl-2-pentanone (MIBK)	122U	2190	2090	96	2190	2220	102	65-135	6.40	(< 20)
Benzene	6.05U	728	770	106	728	782	107	77-121	1.60	(< 20)
Bromobenzene	12.2U	728	753	103	728	762	105	78-121	1.10	(< 20)
Bromochloromethane	12.2U	728	734	101	728	724	99	78-125	1.40	(< 20)
Bromodichloromethane	12.2U	728	793	109	728	791	109	75-127	0.28	(< 20)
Bromoform	12.2U	728	709	97	728	713	98	67-132	0.61	(< 20)
Bromomethane	97.0U	728	871	120	728	826	113	53-143	5.30	(< 20)
Carbon disulfide	48.5U	1090	1270	116	1090	1230	113	63-132	2.80	(< 20)
Carbon tetrachloride	6.05U	728	773	106	728	755	104	70-135	2.30	(< 20)
Chlorobenzene	12.2U	728	760	104	728	770	106	79-120	1.30	(< 20)
Chloroethane	97.0U	728	839	115	728	811	111	59-139	3.40	(< 20)

Print Date: 10/30/2015 11:39:47AM

Matrix Spike Summary

Original Sample ID: 1297574
MS Sample ID: 1297575 MS
MSD Sample ID: 1297576 MSD

Analysis Date: 10/13/2015 20:57
Analysis Date: 10/13/2015 18:50
Analysis Date: 10/13/2015 19:06
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1155836009, 1155836011

Results by **SW8260B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	12.2U	728	719	99	728	713	98	78-123	0.85	(< 20)
Chloromethane	12.2U	728	933	128	728	899	123	50-136	3.80	(< 20)
cis-1,2-Dichloroethene	12.2U	728	748	103	728	736	101	77-123	1.50	(< 20)
cis-1,3-Dichloropropene	12.2U	728	805	111	728	804	110	74-126	0.18	(< 20)
Dibromochloromethane	12.2U	728	718	99	728	719	99	74-126	0.10	(< 20)
Dibromomethane	12.2U	728	727	100	728	704	97	78-125	3.20	(< 20)
Dichlorodifluoromethane	24.3U	728	1000	137	728	951	131	29-149	5.10	(< 20)
Ethylbenzene	12.2U	728	796	109	728	802	110	76-122	0.76	(< 20)
Freon-113	48.5U	1090	1190	108	1090	1170	107	66-136	1.50	(< 20)
Hexachlorobutadiene	24.3U	728	844	116	728	871	120	61-135	3.20	(< 20)
Isopropylbenzene (Cumene)	12.2U	728	804	110	728	791	109	68-134	1.60	(< 20)
Methylene chloride	48.5U	728	725	100	728	719	99	70-128	0.87	(< 20)
Methyl-t-butyl ether	48.5U	1090	1150	105	1090	1160	106	73-125	0.78	(< 20)
Naphthalene	19.7J	728	666	89	728	817	109	62-129	20.40	* (< 20)
n-Butylbenzene	12.2U	728	739	101	728	728	100	70-128	1.50	(< 20)
n-Propylbenzene	9.47J	728	796	108	728	800	109	73-125	0.58	(< 20)
o-Xylene	12.2U	728	762	105	728	766	105	77-123	0.51	(< 20)
P & M -Xylene	24.3U	1460	1570	107	1460	1580	108	77-124	0.79	(< 20)
sec-Butylbenzene	7.77J	728	740	100	728	740	101	73-126	0.10	(< 20)
Styrene	12.2U	728	757	104	728	769	106	76-124	1.60	(< 20)
tert-Butylbenzene	12.2U	728	802	110	728	808	111	73-125	0.69	(< 20)
Tetrachloroethene	6.05U	728	815	112	728	832	114	73-128	2.10	(< 20)
Toluene	12.2U	728	761	105	728	786	108	77-121	3.10	(< 20)
trans-1,2-Dichloroethene	12.2U	728	776	107	728	758	104	74-125	2.30	(< 20)
trans-1,3-Dichloropropene	12.2U	728	722	99	728	730	100	71-130	1.10	(< 20)
Trichloroethene	6.05U	728	807	111	728	806	111	77-123	0.15	(< 20)
Trichlorofluoromethane	24.3U	728	895	123	728	806	111	62-140	10.50	(< 20)
Vinyl acetate	48.5U	728	824	113	728	833	114	50-151	1.10	(< 20)
Vinyl chloride	4.86U	728	903	124	728	864	119	56-135	4.50	(< 20)
Xylenes (total)	36.4U	2190	2330	106	2190	2340	107	78-124	0.70	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		728	725	100	728	726	100	71-136	0.10	
4-Bromofluorobenzene (surr)		1940	1690	87	1940	1740	89	55-151	2.70	
Toluene-d8 (surr)		728	777	107	728	800	110	85-116	2.90	

Print Date: 10/30/2015 11:39:47AM

Matrix Spike Summary

Original Sample ID: 1297574
MS Sample ID: 1297575 MS
MSD Sample ID: 1297576 MSD

QC for Samples: 1155836009, 1155836011

Analysis Date:
Analysis Date: 10/13/2015 18:50
Analysis Date: 10/13/2015 19:06
Matrix: Solid/Soil (Wet Weight)

Results by **SW8260B**

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

Batch Information

Analytical Batch: VMS15333
Analytical Method: SW8260B
Instrument: Agilent 7890-75MS
Analyst: ST
Analytical Date/Time: 10/13/2015 6:50:00PM

Prep Batch: VXX28068
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 51.48g
Prep Extract Vol: 25.00mL

Print Date: 10/30/2015 11:39:47AM

Method Blank

Blank ID: MB for HBN 1722681 [VXX/28072]
Blank Lab ID: 1297617

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	96.8	50-150		%

Batch Information

Analytical Batch: VFC12746
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: CRD
Analytical Date/Time: 10/13/2015 8:22:00PM

Prep Batch: VXX28072
Prep Method: SW5030B
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28072]
Blank Spike Lab ID: 1297620
Date Analyzed: 10/13/2015 19:44

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28072]
Spike Duplicate Lab ID: 1297621
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.993	99	1.00	0.959	96	(60-120)	3.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	99	99	0.0500	97.7	98	(50-150)	1.30	

Batch Information

Analytical Batch: **VFC12746**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **CRD**

Prep Batch: **VXX28072**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2015 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1723767 [VXX/28165]
Blank Lab ID: 1300813

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.751	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	96.4	50-150		%

Batch Information

Analytical Batch: VFC12779
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 10/27/2015 12:59:00PM

Prep Batch: VXX28165
Prep Method: SW5035A
Prep Date/Time: 10/27/2015 8:00:00AM
Prep Initial Wt./Vol.: 49.92 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28165]
Blank Spike Lab ID: 1300814
Date Analyzed: 10/27/2015 13:18

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28165]
Spike Duplicate Lab ID: 1300815
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836009

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	12.7	102	12.5	12.8	103	(60-120)	0.92	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	99	99	1.25	98.6	99	(50-150)	0.47	

Batch Information

Analytical Batch: **VFC12779**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX28165**
Prep Method: **SW5035A**
Prep Date/Time: **10/27/2015 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1723892 [VXX/28170]
Blank Lab ID: 1301301

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836008, 1155836011

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.51J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	97.9	50-150		%

Batch Information

Analytical Batch: VFC12781
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 10/28/2015 3:22:00PM

Prep Batch: VXX28170
Prep Method: SW5035A
Prep Date/Time: 10/28/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28170]
Blank Spike Lab ID: 1301302
Date Analyzed: 10/28/2015 15:41

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28170]
Spike Duplicate Lab ID: 1301303
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836011

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.1	104	12.5	12.7	101	(60-120)	3.00	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	105	105	1.25	103	103	(50-150)	2.20	

Batch Information

Analytical Batch: **VFC12781**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX28170**
Prep Method: **SW5035A**
Prep Date/Time: **10/28/2015 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1723893 [VXX/28171]
Blank Lab ID: 1301304

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836010

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	96.3	50-150		%

Batch Information

Analytical Batch: VFC12781
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 10/28/2015 10:58:00PM

Prep Batch: VXX28171
Prep Method: SW5035A
Prep Date/Time: 10/28/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [VXX28171]
Blank Spike Lab ID: 1301305
Date Analyzed: 10/28/2015 23:17

Spike Duplicate ID: LCSD for HBN 1155836 [VXX28171]
Spike Duplicate Lab ID: 1301306
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836010

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	12.4	99	12.5	12.2	98	(60-120)	1.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	99.7	100	1.25	98.7	99	(50-150)	1.00	

Batch Information

Analytical Batch: **VFC12781**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX28171**
Prep Method: **SW5035A**
Prep Date/Time: **10/28/2015 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1722083 [XXX/34344]
Blank Lab ID: 1295861

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836003, 1155836005

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0250U	0.0500	0.0150	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0250U	0.0500	0.0150	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Fluorobiphenyl (surr)	68.6	53-106		%
Terphenyl-d14 (surr)	96.4	58-132		%

Batch Information

Analytical Batch: XMS9000
Analytical Method: 8270D SIMS LV (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: NRB
Analytical Date/Time: 10/21/2015 6:49:00PM

Prep Batch: XXX34344
Prep Method: SW3520C
Prep Date/Time: 10/7/2015 10:30:37AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [XXX34344]
Blank Spike Lab ID: 1295862
Date Analyzed: 10/21/2015 19:05

Spike Duplicate ID: LCSD for HBN 1155836 [XXX34344]
Spike Duplicate Lab ID: 1295863
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836003, 1155836005

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

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.09	54	2	1.26	63	(41-115)	14.50	(< 20)
2-Methylnaphthalene	2	1.03	52	2	1.22	61	(39-114)	16.60	(< 20)
Acenaphthene	2	1.13	56	2	1.34	67	(48-114)	17.40	(< 20)
Acenaphthylene	2	1.15	58	2	1.39	70	(35-121)	18.90	(< 20)
Anthracene	2	1.37	69	2	1.65	83	(53-119)	18.50	(< 20)
Benzo(a)Anthracene	2	1.87	93	2	1.94	97	(59-120)	3.70	(< 20)
Benzo[a]pyrene	2	1.82	91	2	1.99	99	(53-120)	8.90	(< 20)
Benzo[b]Fluoranthene	2	1.90	95	2	2.03	101	(53-126)	6.60	(< 20)
Benzo[g,h,i]perylene	2	1.90	95	2	1.97	99	(44-128)	3.60	(< 20)
Benzo[k]fluoranthene	2	2.16	108	2	2.11	105	(54-125)	2.40	(< 20)
Chrysene	2	1.99	99	2	2.03	101	(57-120)	1.90	(< 20)
Dibenzo[a,h]anthracene	2	1.96	98	2	2.01	100	(44-131)	2.40	(< 20)
Fluoranthene	2	1.25	63	2	1.53	77	(58-120)	20.10 *	(< 20)
Fluorene	2	1.22	61	2	1.50	75	(50-118)	21.10 *	(< 20)
Indeno[1,2,3-c,d] pyrene	2	2.02	101	2	2.08	104	(48-130)	3.20	(< 20)
Naphthalene	2	1.07	53	2	1.23	62	(43-114)	14.20	(< 20)
Phenanthrene	2	1.29	65	2	1.62	81	(53-115)	22.50 *	(< 20)
Pyrene	2	1.26	63	2	1.53	77	(53-121)	19.40	(< 20)
Surrogates									
2-Fluorobiphenyl (surr)	2	61.5	62	2	74.1	74	(53-106)	18.70	
Terphenyl-d14 (surr)	2	91.3	91	2	96.7	97	(58-132)	5.70	

Batch Information

Analytical Batch: **XMS9000**
Analytical Method: **8270D SIMS LV (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **NRB**

Prep Batch: **XXX34344**
Prep Method: **SW3520C**
Prep Date/Time: **10/07/2015 10:30**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1722280 [XXX/34370]
Blank Lab ID: 1296555

Matrix: Soil/Solid (dry weight)

QC for Samples:
1155836008, 1155836009, 1155836010

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	86.5	60-120		%

Batch Information

Analytical Batch: XFC12151
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: NLL
Analytical Date/Time: 10/11/2015 1:17:00PM

Prep Batch: XXX34370
Prep Method: SW3550C
Prep Date/Time: 10/9/2015 12:22:16PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [XXX34370]
Blank Spike Lab ID: 1296556
Date Analyzed: 10/11/2015 13:27

Spike Duplicate ID: LCSD for HBN 1155836 [XXX34370]
Spike Duplicate Lab ID: 1296557
Matrix: Soil/Solid (dry weight)

QC for Samples: 1155836008, 1155836009, 1155836010

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	150	90	167	127	76	(75-125)	16.60	(< 20)
Surrogates									
5a Androstane (surr)	3.33	93.6	94	3.33	87.5	88	(60-120)	6.70	

Batch Information

Analytical Batch: **XFC12151**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **NLL**

Prep Batch: **XXX34370**
Prep Method: **SW3550C**
Prep Date/Time: **10/09/2015 12:22**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1722676 [XXX/34405]
Blank Lab ID: 1297600

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1155836001, 1155836002, 1155836003, 1155836004

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	107	60-120		%

Batch Information

Analytical Batch: XFC12158
Analytical Method: AK102
Instrument: HP 7890A FID SV E R
Analyst: KJO
Analytical Date/Time: 10/14/2015 10:26:00PM

Prep Batch: XXX34405
Prep Method: SW3520C
Prep Date/Time: 10/14/2015 10:08:17AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1155836 [XXX34405]
Blank Spike Lab ID: 1297601
Date Analyzed: 10/14/2015 22:47

Spike Duplicate ID: LCSD for HBN 1155836 [XXX34405]
Spike Duplicate Lab ID: 1297602
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1155836001, 1155836002, 1155836003, 1155836004

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	20.4	102	20	19.7	98	(75-125)	3.80	(< 20)
Surrogates									
5a Androstane (surr)	0.4	101	101	0.4	96.4	96	(60-120)	4.20	

Batch Information

Analytical Batch: **XFC12158**
Analytical Method: **AK102**
Instrument: **HP 7890A FID SV E R**
Analyst: **KJO**

Prep Batch: **XXX34405**
Prep Method: **SW3520C**
Prep Date/Time: **10/14/2015 10:08**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Page 1 of 1

Section 1

CLIENT: SLR

CONTACT: Jason Gray PHONE NO: 907 272-1112

PROJECT NAME: Alaska Air Kotzebue Groundwater PROJECT/ PWSID/ PERMIT#: 105.00104 14001

REPORTS TO: Jason Gray E-MAIL: jgray@slrconsulting.com

INVOICE TO: Jason Gray QUOTE #:

P.O. #: 12390

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: DRO AK102	GRO AK101	VOCs 8260B	PAHs 8270D SIM	REMARKS/ LOC ID
(1)	A-~~BJ~~ 100115MW1R	10/1/15	1622	W	10	G	X	X	X	X	
(2)	A-BH 100115MW2	"	1400	"		"	X	X	X		
(3)	A-~~BJ~~ 100115MW3R	"	1755	"		"	X	X	X	X	
(4)	A-H 100115MW4	"	1400	"		"	X	X	X		
(5)	A-B 100115MW5	"	1622	"		"				X	
(6)	A-C GWTB1	"	1400	"				X			
(7)	A-C GWTB2	"	1400	"					X		

Section 5

	Date	Time	
Relinquished By: (1)	10/5/15	0800	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	10/5/15	0844	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements: ~~Stage 4~~ Lvl 2

Cooler ID:

Requested Turnaround Time and/or Special Instructions:
Standard

Temp Blank °C: 2.4 / 2.4

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
(INTACT) BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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Page 1 of 1

Section 1

CLIENT: SLR

CONTACT: Jason Gray PHONE NO: 907 222 1112

PROJECT NAME: Alaska Air Kotzebue Groundwater PROJECT/ PWSID/ PERMIT#: 105.00104.14001

REPORTS TO: Jason Gray E-MAIL: jgray@slrconsulting.com

INVOICE TO: Jason Gray QUOTE #: 12390 P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: DRO AK102	Preservative: GRO AK101	Preservative: VOCs 8260B	REMARKS/ LOC ID
(8) AB	093015MW15	9/30/15	1530	S	2		X	X	X	
(9) AB	093015MW35	9/30/15	1220	S	2		X	X	X	
(10) A	100115 SS1	10/1/15	1150	S	2		X	X	X	
11-A JN 10/8/15	STB1	9/30/15	1220					X	X	

Section 5

	Date	Time	
Relinquished By: (1)	10/5/15	0800	Received By:
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	10/5/15	8849	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements: Lvl 2

Cooler ID:

Requested Turnaround Time and/or Special Instructions: Standard

Temp Blank °C: 1.9° / 24 or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT IF IB

(See attached Sample Receipt Form)

105 of 110

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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3180 Peger Rd., Fairbanks, AK 99701 (ph) 907-474-8656, (fax) 907-474-9685

Sample Kit Request

☑ **Client pickup Date:** 9/28/2015 **Time:** 16:30
Be sure to ask if client will ship by ground (DOT) or air carrier (IATA)
☐ **Deliver to client:**
☐ **Ship by/Air Carrier:**
Airbill Number:
Date to ship by:
Notes:

Client Name: SLR Alaska
Ordered By: Jason Gray, Ben Siwiec **e-mail:** jgray@slrconsulting.com
Phone #: (907)264-6965
Project Name: Kotzebue Groundwater **Project/Permit#:** 105.00104.14001
Quote #: 2015 SLR Open Quote - 12390 **Deliverables:** LVL2-ADEC, standard TAT
Delivery:

Kit request taken by: JAN **Date:** 9/28/2015
Kit prepared by: [illegible] **Date:** 9/28/15
Kit *(including lid tightness for pres'd bottles)* checked by: [illegible] **Date:** 28 Sep 15
Kit packed & shipped by: [illegible] **Date:** 9/28/15

No. Samples	Matrix	Analysis	Container Size & Type		Pres.	Bottle Lot #	Preservative Lot #	Hold Time	# QC Bottles	Total Bottles
7	soil	DRO by AK 102	1 x 4-oz	amber glass	None		NA	14 d	0	7
7	soil	GRO by AK101	1 x 4-oz prewt'd	amber w/ septa	MeOH			14 d	0	7
		VOCs by 8260B								
5	water	DRO by AK 102	2 x 250-ml	amber glass	HCl			14 d	0	10
5	water	GRO by AK101	3 x 40-mL	amber w/ septa	HCl			14 d	0	15
5	water	VOCs by 8260B	3 x 40-mL	amber w/ septa	HCl			14 d	0	15
4	water	PAHs by 8270D SIM	2 x 250 mL	amber glass	None			7 d	0	8

☐ Pack for Shipping via ***ground*** (DOT)
☑ Pack for Shipping via ***air carrier*** (IATA)
☑ Temperature Blank (***circle one:*** 120-ml OR 500-ml)
☑ Soil VOA Trip Blank - Lot#: VW8-73-15
☑ Water VOA Trip Blank - Lot#: (2) 129153 7
☐ 524 VOA Trip Blank - Lot#:
☐ Low Level Mercury Trip Blank- Lot#:
☑ Coolers
☑ Gel Ice (***circle one:*** in each cooler OR in a separate cooler)
☐ Bubble Wrap
☑ Labels
☑ Custody Seals
☑ SGS COCs - ***Circle req'd format:*** * Blank COC * DW COC ~~* COC initiated by PM (attached)~~
☐ Send additional instructions/documents *(~~Note to PMs: Be sure to attach copy of requested form.~~)*

☐ Total # includes bottles for % Solids
☐ Track all Lot#
☐ Foreign Soil
☐ Pack similar bottles together OR custom packing *(circle one)*

Other Notes/Reminders for Kit Prep:

Frozen Gel Ice

Attention Client/Sampler:

1. Do not rinse container before filling and be aware of any acid preservative in container.
2. Fill container to top, but do not overfill (except volatiles which should be headspace free).
3. Label the container with your sample/site ID, as well as the date & time of collection.
4. Fill in the Chain of Custody.
5. Add frozen gel packs or ice to your cooler & pack to prevent breakage.

Charges may be invoiced for bottles which are unused or improperly used.
If you have any questions concerning this sample kit,
please contact your Project Manager for assistance. ***Thank you.***

SGS

Returned Bottles Inventory

Name of individual returning bottles: Jason Gray

Date Received: 10/05/15

Client Name: SLR

Received by: EDJ

Project Name: Alaska Air Kotzebue GW

SGS PM: ~~ft~~ EDJ JN

HDPE/Nalgene:	1-L						
	500-ml						
	250-ml or 8-oz						
	125-ml or 4-oz						
	60-ml or 2-oz						
	other						
amber glass:	1-L						
	500-ml						
	250-ml or 8-oz	3					
	125-ml or 4-oz with or without septa	8					
	40-ml VOA vial	~~10~~ 9 EDJ					
	other						
Subtotal:							

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***

Amount to Invoice Client $: 80

WO#: 1155836

1155836

SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	☑ ☑	☐ ☐	☐ ☐	***Exemption permitted if sampler hand carries/delivers.*** 2 Side
Temperature blank compliant* (i.e., 0-6°C after CF)? *If >6 °C, were samples collected <8 hours ago?* *If <0 °C, were all sample containers ice free?* Cooler ID: [1] _____ @ 2.4 _____ w/ Therm.ID: 241 _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled."	☑ ☐ ☐	☐ ☑ ☑	☐ ☐ ☐	***Exemption permitted if chilled & collected <8 hrs ago.*** ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery method (specify all that apply): ☑Client (hand carried) ☐USPS ☐Lynden ☐AK Air ☐Alert Courier ☐UPS ☐FedEx ☐RAVN ☐C&D Delivery ☐Carlile ☐Pen Air ☐Warp Speed ☐Other: _____ → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	☐	☑	☐	
	Yes	N/A	No	
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	☑ ☑ ☑	☐ ☐ ☐	☐ ☐ ☐	***Note: Refer to form F-083 "Sample Guide" for hold times.*** ***Note: If times differ <1hr, record details and login per COC.***
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): ☐Bubble Wrap ☐Separate plastic bags ☐Vermiculite ☐Other:	☑	☐	☐	
Were **proper containers** (type/mass/volume/preservative*) used? Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	☑ ☑ ☑ ☑	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ***Exemption permitted for metals (e.g., 200.8/6020A).***
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	☑ ☐	☐ ☑	☐ ☐	
For **special handling** (e.g., "MI" soils, foreign soils, lab filter for dissolved…, lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	☑	☐	☐	Limited volume for water TBs.
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	☐	☑	☐	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	☐	☑	☐	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	☐	☑	☐	SRF Completed by: EDJ PM notified:
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	☑	☐	☐	Peer Reviewed by: DC
Additional notes (if applicable):				

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

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1155836001-A	HCL to pH < 2	OK
1155836001-B	HCL to pH < 2	OK
1155836001-C	HCL to pH < 2	OK
1155836001-D	HCL to pH < 2	OK
1155836001-E	HCL to pH < 2	OK
1155836001-F	HCL to pH < 2	OK
1155836001-G	HCL to pH < 2	OK
1155836001-H	HCL to pH < 2	OK
1155836001-I	No Preservative Required	OK
1155836001-J	No Preservative Required	OK
1155836002-A	HCL to pH < 2	OK
1155836002-B	HCL to pH < 2	OK
1155836002-C	HCL to pH < 2	OK
1155836002-D	HCL to pH < 2	OK
1155836002-E	HCL to pH < 2	OK
1155836002-F	HCL to pH < 2	OK
1155836002-G	HCL to pH < 2	OK
1155836002-H	HCL to pH < 2	OK
1155836003-A	HCL to pH < 2	OK
1155836003-B	HCL to pH < 2	OK
1155836003-C	HCL to pH < 2	OK
1155836003-D	HCL to pH < 2	OK
1155836003-E	HCL to pH < 2	OK
1155836003-F	HCL to pH < 2	OK
1155836003-G	HCL to pH < 2	OK
1155836003-H	HCL to pH < 2	OK
1155836003-I	No Preservative Required	OK
1155836003-J	No Preservative Required	OK
1155836004-A	HCL to pH < 2	OK
1155836004-B	HCL to pH < 2	OK
1155836004-C	HCL to pH < 2	OK
1155836004-D	HCL to pH < 2	OK
1155836004-E	HCL to pH < 2	OK
1155836004-F	HCL to pH < 2	OK
1155836004-G	HCL to pH < 2	OK
1155836004-H	HCL to pH < 2	OK
1155836005-A	No Preservative Required	OK
1155836005-B	No Preservative Required	OK
1155836006-A	HCL to pH < 2	OK
1155836006-B	HCL to pH < 2	OK
1155836007-A	HCL to pH < 2	OK
1155836007-B	HCL to pH < 2	OK
1155836008-A	No Preservative Required	OK
1155836008-B	Methanol field pres. 4 C	OK
1155836009-A	No Preservative Required	OK
1155836009-B	Methanol field pres. 4 C	OK
1155836010-A	No Preservative Required	OK
1155836010-B	Methanol field pres. 4 C	OK
1155836011-A	Methanol field pres. 4 C	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
BU - The container was received with headspace greater than 6mm.

APPENDIX E

DATA QUALITY ASSURANCE REVIEW AND ADEC LABORATORY CHECKLIST

ALASKA AIRLINES
Alaska Airlines, Inc
PO Box 68900-SEAZE
Seattle, WA 98168-0900

December 2015

LABORATORY DATA
QUALITY ASSURANCE REVIEW

ALASKA AIRLINES KOTZEBUE
GROUNDWATER MONITORING

SLR Project Number 105.00104.14001
ADEC File Number 410.26.005

This report summarizes a review of analytical results for work order number 1155836, for samples collected on September 30, 2015 and October 1, 2015. Samples were collected by SLR International Corporation (SLR), and submitted to SGS North America Inc. (SGS) in Anchorage, Alaska. Samples were analyzed for the following parameters:

- Gasoline range organics (GRO), using Alaska Method 101 (AK101)
- Diesel range organics (DRO), using Alaska Method 102 (AK102), low volume
- Volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) SW-846 Method 8260B
- Polynuclear aromatic hydrocarbons (PAHs), using USEPA SW-846 Method 8270D with selective ion monitoring (SIM), low volume

Both soil and water samples were collected for this sampling event. Soil samples were collected for waste characterization purposes only. Waste characterization data were not included in the quality assessment report (QAR). A cursory review of the data was performed upon receipt.

Quality Assurance Program

A quality assurance (QA) program was followed that addressed project administration, sampling protocols, data review, and data QA. Sample QA was provided by SLR through adherence to sampling protocols. Chain of custody (COC) procedures were followed as an integral part of the QA program.

Data validation consisted of the following:

- Verifying that quality control (QC) blanks were properly prepared, identified, and analyzed.
- Reviewing COC records for completeness, signatures, and dates.
- Verifying that surrogate analyses (when applicable) were within recovery acceptance limits.
- Verifying that Laboratory Control Samples (LCS) and Laboratory Control Sample Duplicates (LCSD) were within recovery acceptance limits.
- Verifying that Continuing Calibration Verification (CCV) recoveries were within applicable acceptance limits.

- Evaluating the result relative percent difference (RPD) between primary and duplicate field samples and LCS and LCSD.
- Evaluating whether laboratory reporting limits met project goals.
- Providing an overall assessment of laboratory data quality and qualifying sample results if necessary.

Data Qualifications

The comments presented in this QA review refer to the field procedures and the laboratory's performance in meeting the QC specifications. The sample results were reviewed using the following documents:

- Alaska Department of Environmental Conservation (ADEC), 18 AAC 75, Oil and Other Hazardous Substances Pollution Control (June 17, 2015).
- ADEC, Underground Storage Tanks Procedure Manual Guidance for Treatment of Petroleum – Contaminated Soil and Water and Standard Sampling Procedures (November 2002).
- ADEC, Technical Memorandum – 06-002, Environmental Laboratory Data and Quality Assurance Requirements (March 2009).
- USEPA Document 530/SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, fourth edition (November 1991).

Data Validation

Data Packages
The data package was checked for transcription errors, omissions, or other anomalies. No issues were noted with regards to the data package.

Sample Receipt
The sample receipt documentation was checked for anomalies. No issues were noted with regards to the receipt of the samples, except as noted below.

- Two coolers were received at SGS, Anchorage. Only one cooler temperature (2.4°C) was recorded on the sample receipt form. Each cooler temperature was written on the correct COC page. Refer to the Holding Times and Preservation section below for a discussion of cooler receipt temperatures. Data was not impacted.

Holding Times and Preservation
Samples were appropriately preserved upon collection and were submitted to SGS. Sample analyses were conducted within holding time criteria. No issues were noted in regard to sample preservation, except as noted below.

- Two coolers were submitted to SGS, Anchorage with temperature blanks at 1.9°C and 2.4°C. One of two was slightly below the ADEC required temperature range of 4±2°C. The cooler received at 1.9°C contained only waste soil samples. Waste samples were not reviewed in this QAR. The cooler containing groundwater samples was received

with a temperature blank within the ADEC required 4±2°C. All data was usable without qualification.

Laboratory Method Blanks
Laboratory method blanks were analyzed at the appropriate frequencies. Analytes were not detected in method blanks at or above the limit of detection (LOD).

Trip Blanks
Laboratory trip blanks were analyzed at the appropriate frequencies. Analytes were not detected at or above the LOD in either trip blank.

Surrogate Recovery Results
Surrogate analysis was performed at the required frequencies. All surrogate recoveries were within analytical method and SGS percent recovery acceptance limits, except as noted below.

- For Method AK101, 4-bromofluorobenzene surrogate in sample 100115MW1R recovered above the acceptable upper control limit of 150%. This was likely due to matrix interference. The GRO result for this sample was qualified with an "M+", and should be considered estimated with a potential high bias. Since a high bias was indicated and the affected result was below the applicable cleanup level of 2.2 mg/L listed in 18 AAC 75, Method Two, Table C, Groundwater Cleanup Levels (ADEC, June 17, 2015), data usability was not affected.

Calibration Verifications

CCVs were performed at the required frequencies. It should be noted that CCV recoveries were included only in the electronic data deliverables, not in the case narrative. All CCV percent recoveries were within analytical method and SGS percent recovery acceptance limits as reviewed in the data deliverables.

- For VOCs by SW8260B, 2-butanone recovered above the acceptable upper control limit in the CCV for analytical batch VMS15328. Associated samples were 100115MW1R, 100115MW2, 100115MW3R, 100115MW4, and GWTB2. Since a high bias was indicated and all associated samples were non-detect for this analyte, data was not impacted. All data was usable without qualification.

Field Duplicates
Three primary groundwater samples and one duplicate sample were submitted for GRO by AK101, DRO by AK102 and VOCs by SW8260B. Two primary groundwater samples and one duplicate sample were submitted for PAH SIM by SW8270D. The field duplicate sample frequency was in compliance with regulatory requirements because a minimum of one per every ten field samples for each matrix, method and target analyte was achieved. All field duplicates were submitted blind to the laboratory.

The following field duplicates were collected:

- 100115MW5 is the duplicate to primary sample 100115MW1R.
- 100115MW4 is the duplicate to primary sample 100115MW2.

All RPDs between parent and duplicate samples were within limits for all analytes detected above the LOQ (less than 30% required for water samples), except as noted in the table below.

Results for samples listed in the table are recommended for qualification with a “QN”, and should be considered estimated with unknown bias.

For acenaphthene, both affected results were well below the applicable cleanup level, therefore, all data was usable as qualified. For DRO, to err on the conservative, the higher of the two values should be reported. The reported value exceeds the applicable cleanup level listed in 18 AAC 75, Table C, Groundwater Cleanup Levels (ADEC, June 17, 2015). Data is usable as qualified.

RELATIVE PERCENT DIFFERENCES						
Primary Sample	**Duplicate Sample**	**Analyte**	**Primary Result (mg/L)**	**Duplicate Result (mg/L)**	**RPD**	**Cleanup Level (mg/L)**
100115MW1R	100115MW5	acenaphthene	ND[1] [0.000024]	0.000167	149%	2.2
100115MW2	100115MW4	DRO	1.47	2.29	44%	1.5

1 - For non-detect results, the LOD [listed in brackets] was used to calculate RPD.

RPDs for all duplicate/parent sample pairs with both results below the LOQ are considered to be acceptable without qualification.

Laboratory Control Samples/Laboratory Control Duplicate Samples
LCS and LCSDs were analyzed at the appropriate frequencies. LCS/LCSD results and RPDs met percent recovery acceptance limits, except as noted below.

- For PAH SIMs by Method SW8270D, LCS/LCSD RPDs for fluorene and phenanthrene slightly exceeded laboratory limits. Associated samples were 100115MW1R, 100115MW3R, and 100115MW5. All associated samples had results of non-detect for the affected analytes; therefore, data was not impacted. All data was usable without qualification.

Laboratory Duplicate Samples
No laboratory duplicates were analyzed with these groundwater samples.

Matrix Spike/Matrix Spike Duplicate Samples
No MS and MSD samples were analyzed with these groundwater samples.

Limits of Detection
LODs were compared to applicable cleanup levels for the site. LODs were compared with 18 AAC 75 *Oil and Other Hazardous Substances Pollution Control*, Method Two, Table C, Groundwater Cleanup Levels (ADEC, June 17, 2015). All results of non-detect had LODs at or below applicable cleanup levels, except as shown in the table below.

The table below shows results of nondetect with LODs and DLs not meeting project limits. All affected analytes were VOCs by SW8260. In some instances the detection limit (DL) met project goals where the LOD did not. In these cases, data was considered to have met project goals. This data was not presented in the table. For all analytes presented in the table, typical methodology limitations caused the LOD and DL to not meet project goals. Data quality was not impacted; however, it is not possible to determine with certainty whether the analytes were present in the affected samples over the cleanup levels.

Sample ID	Laboratory ID	Method Analyte	Result (mg/L)	Dilution	LOD (mg/L)	DL (mg/L)	ADEC Limit (mg/L)
100115MW1R	1155836001	SW8260B 1,2,3-Trichloropropane	ND	10	0.005	0.0031	0.00012
100115MW2	1155836002		ND	1	0.0005	0.00031	
100115MW3R	1155836003		ND	10	0.005	0.0031	
100115MW4	1155836004		ND	1	0.0005	0.00031	
GWTB2	1155836007		ND	1	0.0005	0.00031	
100115MW1R	1155836001	SW8260B 1,2-Dibromoethane	ND	10	0.005	0.0031	0.00005
100115MW2	1155836002		ND	1	0.0005	0.00031	
100115MW3R	1155836003		ND	10	0.005	0.0031	
100115MW4	1155836004		ND	1	0.0005	0.00031	
GWTB2	1155836007		ND	1	0.0005	0.00031	
100115MW1R	1155836001	SW8260B Vinyl chloride	ND	10	0.005	0.0031	0.002
100115MW3R	1155836003		ND	10	0.005	0.0031	

Overall Assessment

This data was considered of good quality acceptable for use as qualified.

Precision, Accuracy, Representativeness, Comparability, Completeness, and Sensitivity

- Precision: Precision goals were met, except as noted in the Field Duplicates and LCS/LCSD sections.
- Accuracy: Accuracy goals were met except as noted in the Surrogate Recovery and CCV sections.
- Representativeness: Representativeness goals were met.
- Comparability: Comparability goals were met.
- Completeness: Completeness goals were met.
- Sensitivity: Sensitivity goals were met, except as noted in the Limits of Detection section.

Laboratory Data Review Checklist

Completed by: Jennifer McLean

Title: Project Scientist Date: November 12, 2015

CS Report Name: Alaska Airlines Kotzebue GW Monitoring Report Date: October 30, 2015

Consultant Firm: SLR International Corporation

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1155836

ADEC File Number: 410.26.005 ADEC RecKey Number: NA

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

   b. Correct analyses requested?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Two coolers were submitted to SGS, Anchorage with temperature blanks at 1.9°C and 2.4°C. One of two was slightly below the ADEC required temperature range of 4±2°C. The cooler received at 1.9°C contained only waste soil samples. Waste samples were not reviewed in this QAR. The cooler containing groundwater samples was received with a temperature blank within the ADEC required 4±2°C.

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

A limited volume for the trip blanks was noted. Trip blanks were analyzed for appropriate methods.

e. Data quality or usability affected? (Please explain.)

Comments:

All data was usable without qualification.

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

The laboratory case narrative addresses both soil and water samples. Since soil samples were waste characterization, a cursory review was conducted upon receipt of data. Only water samples were reviewed in the QAR and checklist.

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

c. Were all corrective actions documented?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

None were taken.

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

Comments:

No impact.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

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

      Soil samples were waste characterization, thus were not reviewed in this checklist.

   d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
      ☐ Yes ☒ No ☐ NA (Please explain.) Comments:

      LODs were compared with 18 AAC 75 *Oil and Other Hazardous Substances Pollution Control*, Method Two, Table C, Groundwater Cleanup Levels (ADEC, June 17, 2015). All results of non-detect had LODs at or below applicable cleanup levels, except as noted in the table in the Limits of Detection section of the QAR.
      The table shows results of nondetect with LODs and detection limit (DLs) not meeting project limits. All affected analytes were VOCs by SW8260 (1,2,3-trichloropropane, 1,2-dibromoethane, and vinyl chloride). In some instances the (DL) met project goals where the LOD did not. In these cases, data was considered to have met project goals. This data was not presented in the table. For all analytes presented in the table, typical methodology limitations caused the LOD and DL to not meet project goals.

   e. Data quality or usability affected?
      Comments:

      Data quality or usabilitywas not impacted; however, it is not possible to determine with certainty whether the analytes were present in the affected samples over the cleanup levels.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
         ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
         ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. If above PQL, what samples are affected?

Comments:

Not applicable.

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

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

Comments:

No impact.

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No inorganics were analyzed with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

For VOCs by SW8260B, 2-butanone recovered above the acceptable upper control limit in the CCV for analytical batch VMS15328.

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

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

For PAH SIMs by Method SW8270D, LCS/LCSD RPDs for fluorene and phenanthrene slightly exceeded laboratory limits

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

Comments:

For VOCs by SW8260B, associated samples were 100115MW1R, 100115MW2, 100115MW3R, 100115MW4, and GWTB2.
For PAH SIMs by Method SW8270D, associated samples were 100115MW1R, 100115MW3R, and 100115MW5.

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

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

For VOCs by SW8260B, since a high bias was indicated and all associated samples were non-detect for this analyte, data was not qualified.
For PAH SIMs by Method SW8270D, all associated samples had results of non-detect for the affected analytes; therefore, data was not qualified.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data was not impacted. All data was usable without qualification.

c. Surrogates – Organics Only

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

For Method AK101, 4-bromofluorobenzene surrogate in sample 100115MW1R recovered above the acceptable upper control limit of 150%.

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

The surrogate exceedance was likely due to matrix interference. The GRO result for this sample was qualified with an “M+”, and should be considered estimated with a potential high bias.

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Since a high bias was indicated and the affected result was below the applicable cleanup level of 2.2 mg/L listed in 18 AAC 75, Method Two, Table C, Groundwater Cleanup Levels (ADEC, June 17, 2015), data usability was not affected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

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

Comments:

No impact.

e. Field Duplicate

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

100115MW5 is the duplicate to primary sample 100115MW1R.
100115MW4 is the duplicate to primary sample 100115MW2.

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

RPD (%) = 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 ☐ NA (Please explain.) Comments:

Acenaphthene results for parent sample 100115MW1R and duplicate 100115MW5, and DRO results for parent sample 100115MW2 and duplicate 100115MW4, exceeded the required 30%RPD; therefore, are recommended for qualification with a "QN", and should be considered estimated with unknown bias.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

For acenaphthene, both affected results were well below the applicable cleanup level, therefore, all data was usable as qualified. For DRO, to err on the conservative, the higher of the two values should be reported. The reported value exceeds the applicable cleanup level listed in 18 AAC 75, Table C, Groundwater Cleanup Levels (ADEC, June 17, 2015). All data was usable as qualified.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

Samples were collected with disposable equipment.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No impact.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments: