March 31, 2020

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Subject: Letter Report for ARRC Hurricane Groundwater Monitoring 2019 Rev. 5.0
ADEC File No. 2258.26.008

Mr. Grandel:

Restoration Science & Engineering, LLC (RSE) is providing the following letter report for field efforts conducted in 2019 at the Alaska Railroad Corporation (ARRC) Hurricane Siding site located at Milepost 281.4, near Hurricane, Alaska (see Figure 1 in Attachment A). These field-related efforts include groundwater sampling of four (4) existing monitoring wells (RSE-1, RSE-2, RSE-3 and RSE-4), installation of three (3) new soil borings completed as temporary monitoring wells (RSE-5, RSE-6 and RSE-7) (see Figure 2 in Attachment A for well locations). This site is listed under file 2258.26.008 in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database.

SITE OVERVIEW

In 1990, two (2) underground storage tanks (USTs), one (1) 500-gallon gasoline and one (1) 7,500 diesel were removed from the ARRC Hurricane Siding site. At that time, laboratory analytical data for soil samples indicated elevated concentrations of volatile petroleum hydrocarbons at the gasoline UST excavation area, and elevated concentrations of total petroleum hydrocarbons at the diesel UST excavation area.

In September 2011, RSE provided environmental oversight for the advancement of four (4) soil borings later completed as groundwater monitoring wells (RSE-1, RSE-2, RSE-3 and RSE-4) to define the horizontal and vertical extent of remaining petroleum hydrocarbon impacts. Analytical soil samples analyzed for hydrocarbons confirmed subsurface soil conditions were below ADEC Method 2 Migration to Groundwater (MTG) soil cleanup levels. A groundwater sample from monitoring well RSE-4 measured 1.52 mg/L diesel range organics (DRO), nominally above the ADEC Table C Groundwater cleanup level of 1.5 mg/L (see Figure 1 in Attachment B). Monitoring well RSE-4 is downgradient of the former UST location. All other September 2011 groundwater

sample results showed DRO below the 1.5 mg/L ADEC Table C Groundwater cleanup level (RSE, 2011).

Groundwater sampling events were conducted at the four (4) wells by Fairbanks Environmental Services (FES) in 2012, 2013, 2014 and 2016. 2012 groundwater sample results were found to be non-detect or below ADEC Table C Groundwater cleanup levels (FES, 2012). In 2013, DRO and RRO results in RSE-3 were found to be 5.51 mg/L and 1.34 mg/L, respectively. All other 2013 sample results were either non-detect or below ADEC Table C Groundwater cleanup levels (FES, 2013). DRO results in RSE-3 was measured at 1.88 mg/L in 2014, while all other 2014 groundwater sample results were either non-detect or below ADEC Table C Groundwater cleanup levels (FES, 2014). All 2016 groundwater sample results were either non-detect or below the ADEC Table C Groundwater cleanup levels (FES, 2016).

RSE conducted groundwater sampling efforts of the four (4) wells in 2017 and 2018. In 2017, monitoring well RSE-3 exhibited a DRO concentration of 1.95 mg/L, slightly above the ADEC Table C Groundwater cleanup level of 1.5 mg/L. During the 2017 assessment, sampling of RSE-4 resulted in naphthalene concentrations exceeding the new (2016) established ADEC Table C cleanup levels (RSE, 2017).

RSE sampled RSE-1, RSE-2, RSE-3 and RSE-4 in September of 2018 and completed a groundwater elevation survey of these four wells. Elevation data indicate a groundwater gradient to the northwest. Sample results from this event indicate that RSE-3 and RSE-4, the downgradient wells, yielded DRO and naphthalene levels above ADEC Table C cleanup levels (RSE, 2019b).

Historic hydrocarbon data for the ARRC Hurricane site can be found in Table 9 of Attachment A.

2019 OBJECTIVES

The objectives of the 2019 field efforts were to: install three (3) shallow soil borings (3-5 feet bgs) to be completed as temporary monitoring wells to observe downgradient impacts from RSE-3 and RSE-4; to collect soil and groundwater samples from these soil borings/monitoring wells; to collect groundwater samples from the four existing wells; and to complete a groundwater elevation survey of monitoring wells RSE-1, RSE-2, RSE-3 and RSE-4.

CONTAMINANTS OF POTENTIAL CONCERN

RSE identified the following contaminants of potential concern (COPCs):

Table A. Contaminants of Potential Concern in Soil

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Soil Cleanup Level
Gasoline Range Organics	Soil	GRO	AK 101	300 mg/Kg
Diesel Range Organics	Soil	DRO	AK 102	250 mg/Kg
Residual Range Organics	Soil	RRO	AK 103	11,000 mg/Kg
Petroleum Volatile Organic Compounds	Soil	Petro VOCs	EPA 8260C	Varies
Polycyclic Aromatic Hydrocarbons	Soil	PAH SIMs	EPA 8270D	Varies

Table B. Contaminants of Potential Concern in Groundwater

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Groundwater Cleanup Level[1]
Gasoline Range Organics	Water	GRO	AK 101	2.2 mg/L
Diesel Range Organics	Water	DRO	AK 102	1.5 mg/L
Residual Range Organics	Water	RRO	AK 103	1.1 mg/L
Petroleum Volatile Organic Compounds	Water	Petro VOCs	EPA 8260C	Varies
Polycyclic Aromatic Hydrocarbons	Water	PAH SIMs	EPA 8270D	Varies

FIELD EFFORTS – GROUNDWATER SAMPLING (RSE-1, RSE-2, RSE-3 AND RSE-4) AND NEW SOIL BORING INSTALLATION (RSE-5, RSE-6 AND RSE-7)

From October 1-2, 2019, RSE mobilized to the subject property to conduct the field efforts outlined in the objectives section of this report and in accordance with the ADEC-approved work plan, dated September 17, 2019. On October 1, 2019, RSE sampled groundwater in existing wells, RSE-1, RSE-2, RSE-3 and RSE-4; and installed three (3) new soil borings to be completed as temporary monitoring wells: RSE-5, RSE-6, and RSE-7, to 3 feet bgs using a JMC vibratory drive sampler (see Figure 2 in Appendix A soil boring locations).

RSE measured the depth to the bottom of each existing well (RSE-1, RSE-2, RSE-3 and RSE-4), and the depth to groundwater. Groundwater was encountered between 1.5 feet bgs and 4.5 feet bgs. Following these observations, RSE purged three (3) well volumes from each well using a low-flow submersible pump. Water quality parameters were monitored using a YSI 556 for stabilization when readings collected 3-5 minutes apart were within the following:

- pH ± 0.1
- Temperature ±3% (minimum of ± 0.2ºC)
- Conductivity ± 3%
- Dissolved Oxygen ±10%

Tabulated water quality data can be found as Table 5 in Attachment B.

RSE re-measured the depth to groundwater following purging, and prior to sampling, with a water level indicator. The groundwater levels were found to be slightly below their pre-purging levels during this second measurement. Water samples from monitoring wells RSE-1, RSE-2, RSE-3, and RSE-4 were collected using a positive-pressure submersible pump set to a low flow rate during purging and sampling.

One (1) primary groundwater sample was collected from monitoring wells RSE-1, RSE-2, RSE-3 and RSE-4 and was analyzed for DRO, RRO, GRO, Petro VOCs, and PAH SIMs. A duplicate sample was collected from RSE-3 (RSE-X) for quality control purposes.

Groundwater samples from RSE-1, RSE-2, RSE-3 and RSE-4 were collected using new, dedicated tubing. The water level indicator and any other equipment that is not disposable or dedicated, such as the water level indicator or submersible pump was decontaminated with a distilled water and Alconox wash in the field. As water samples were collected, care was taken to minimize volatile loss by excessive turbulence or air mixing. Field personnel avoided spilling or over-diluting acid sample preservatives. Water samples were placed directly into method specific containers and stored in a clean sample cooler chilled to between 0° and 6° C. Coolers were transported under chain-of-custody to ADEC-approved laboratory, SGS North America (SGS) located in Anchorage, Alaska.

On October 1, 2019, RSE collected one (1) field-screening soil sample and one (1) primary analytical soil sample from soil borings RSE-5, RSE-6 and RSE-7, as well as one (1) duplicate analytical soil sample from RSE-7 (RSE-X). Limited soil recoveries did not allow for additional soil samples from each boring. Field-screening samples were placed into a plastic bag and warmed to at least 60°F prior to analyzing. Field-screening samples were analyzed using a photo-ionization detector (PID) calibrated to 100 parts per million by volume (ppmv) isobutylene.

All soil samples were collected using a clean, stainless-steel spoon and clean nitrile gloves Analytical soil samples were collected in order of volatility with GRO and VOCs collected first, and non-volatiles collected thereafter. Analytical soil samples were placed directly into method-specific sample jars provided by SGS North America Inc. (SGS), an ADEC-approved laboratory. The

soil sample containers were placed into a cooler packed with gel-ice and maintained between 0° and 6°C. RSE field personnel noted the analytical soil sample ID, location, the depth below surface, sample time, and soil type. All analytical soil samples were transported under chain of custody (COC) to SGS for analyses. Each soil sample was analyzed for COPC in accordance with Table D.

Equipment limitations did not allow for RSE to collect soil samples any further than a 3 feet depth at the time as monitoring well RSE-4, located at approximately the same elevation yielded groundwater at 1.5 bgs. RSE installed 1-inch plastic tubing to 3 feet bgs in RSE-5, RSE-6 and RSE-7 and allowed the groundwater to stabilize for at least 24 hours.

The following day (October 2, 2019), RSE returned to the site to sample groundwater in temporary monitoring wells RSE-5, RSE-6, and RSE-7. However, no groundwater was present in these three soil borings.

RSE installed two (2) additional soil borings to approximately 3 feet bgs, RSE-8 and RSE-9 to provide supplemental soil data, as the groundwater sampling effort failed. One (1) field-screening sample was collected from RSE-8 and RSE-9, however no analytical soil samples were collected from these borings. Field-screening results for RSE-8 and RSE-9 were 189.4 ppmv and 1,271 ppmv, respectively. The highest field-screening result for RSE-7 was 114.8 ppmv, indicating that the contamination might be greater at the locations of soil borings RSE-8 and RSE-9 than at RSE-7.

On October 17, 2019, RSE returned to the site with piezometers and a JMC Vibratory Drive sampler equipped to drill to 9 feet bgs to re-install soil borings RSE-5, RSE-6 and RSE-7. RSE used the JMC Vibratory Drive Sampler to install a soil boring to 9 feet bgs at RSE-5. RSE collected three (3) field-screening samples from this soil boring. RSE then attempted to install a 7-foot metal piezometer in soil boring RSE-5, however, it would only install to approximately three (3) feet bgs due to dense native silty material. RSE removed the piezometer and used the water level indicator to observe the depth to groundwater in the borehole. No groundwater was observed in RSE-5.

RSE used the JMC Vibratory Drive Sampler to install soil boring RSE-6 to approximately 6 feet bgs, and collected two (2) field-screening samples during installation. RSE installed a hollow 1-inch plastic tube in soil boring RSE-6 to approximately 5 feet bgs. RSE ran the water level indicator through the hollow tubing to observe the depth to groundwater. No groundwater was observed in RSE-6.

RSE used the JMC Vibratory Drive Sampler to install soil boring RSE-7 to 6 feet bgs. RSE collected two (2) field-screening samples from soil boring RSE-7. Then a hollow 1-inch plastic tube was installed into soil boring RSE-7 to approximately 6 feet bgs. A check with the water level indicator indicated that there was no water in RSE-7 at approximately 6 feet bgs.

Field-screening information can be found as Table 1 in Attachment B. All analytical soil samples were analyzed for GRO, DRO, RRO, Petro VOCs and PAH SIMs. Field-screening and analytical soil samples were collected in general accordance with ADEC sampling guidelines and the ADEC-approved work plan, dated July 2, 2019 (RSE, 2019a).

GROUNDWATER ELEVATION SURVEY

RSE conducted the groundwater elevation survey for RSE-1, RSE-2, RSE-3 and RSE-4 on October 1, 2019 using a Leica Rugby 620 and a Leica Rod Eye 160. RSE performed the survey two times to ensure accuracy. There two sets were within 0.02 feet of each other, indicating that the data gathered is adequate for a gradient determination. A temporary benchmark (TBM) was established using the northeast corner of the skid frame for the above ground storage tank (AST) frame. This AST is located north of the Hurricane Section House. The TBM location is shown in Figure 2 of Attachment A.

RSE reduced the groundwater elevation data and then uploaded it into Surfer, a gradient modeling software program. RSE used Surfer to create a groundwater gradient figure using this data and overlaid it onto the site map (Figure 2 in Attachment A). A 2018 groundwater elevation survey shows a relatively flat gradient with a slight flow towards the northwest. The 2019 groundwater gradient confirms the trend observed in 2018. The 2019 groundwater gradient can be seen in Figure 2 of Attachment A.

GROUNDWATER SAMPLE RESULTS

On October 1, 2019, RSE collected four (4) primary groundwater samples, RSE-1, RSE-2, RSE-3 and RSE-4, as well as one (1) duplicate groundwater sample, RSE-X from RSE-3. No groundwater was encountered in soil borings RSE-5, RSE-6, RSE-7, RSE-8 and RSE-9, so no groundwater samples were collected from these areas. All results for all groundwater samples were non-detect or below their ADEC Table C Groundwater cleanup levels. Duplicate RSE-X was submitted to the lab for quality assurance purposes.

Tabulated groundwater data can be found in Tables 6-9 of Attachment B. The laboratory report can be found in Attachment E.

SOIL SAMPLE RESULTS

RSE collected three (3) primary analytical soil samples, RSE-5, RSE-6 and RSE-7, and one (1) duplicate sample, RSE-X from RSE-7. No analytical soil samples were collected from soil borings RSE-8 and RSE-9 during the October 1st and 2nd field effort. DRO results in RSE-6, RSE-7 and its duplicate RSE-X were 391 mg/Kg, 2,610 mg/Kg and 375 mg/Kg, respectively, and above the MTG cleanup level of 250 mg/Kg. All RRO and GRO results for the soil samples were non-detect or below their MTG cleanup levels.

RSE-7 and its duplicate RSE-X yielded results for several VOC analytes that were above the MTG cleanup levels. 1,2,4-trimethylbenzene results for RSE-7 and RSE-X were 3,670 micrograms per kilogram (µg/Kg) and 1,750 µg/Kg, respectively, significantly above the MTG cleanup level of 610 µg/Kg. 1,3,5-trimethylbenzene results for RSE-7 and RSE-X were 1,870 µg/Kg and 886 µg/Kg, respectively, above the MTG cleanup level of 660 µg/Kg. Additionally, naphthalene results for RSE-7 and RSE-X were 948 µg/Kg and 546 µg/Kg, respectively, above the MTG cleanup level of 38 µg/Kg.

RSE-7 and its duplicate RSE-X also yielded PAH SIM analytes above their MTG cleanup levels. 1-methylnaphthalene results for RSE-7 and RSE-X were 2,540 µg/Kg and 357 µg/Kg, respectively, above the MTG cleanup level of 330 µg/Kg. 2-methylnaphthalene results for RSE-7 and RSE-X were 2,940 µg/Kg, above the MTG cleanup level of 410 µg/Kg. Additionally, RSE-7 and RSE-X yielded naphthalene results of 693 µg/Kg and 103 µg/Kg, respectively.

All other soil sample results for all analytes were non-detect or below MTG cleanup levels. Tabulated soil data can be found in Tables 2-4 of Attachment B. The laboratory report can be found in Attachment E.

INVESTIGATIVE DERIVED WASTE

Consumables such as dedicated tubing, Ziploc™ bags, and nitrile gloves were placed into a trash receptacle for landfill disposal. Non-consumables such water level indicator and submersible pump were decontaminated using Alconox and distilled water between sampling at each well.
No sheen or odor was observed during sampling efforts. All decontamination and purge water collected during the October 1, 2019 groundwater sampling efforts was run through a granulated activated carbon (GAC) filter onto a vegetated area approximately 100 feet away from the nearest well.

Soil cuttings from RSE-5, RSE-6, RSE-7, RSE-8 and RSE-9 were placed back into their hole of origin, at approximately the depths from which they were collected.

QUALITY ASSURANCE AND QUALITY CONTROL

RSE collected each groundwater and soil sample in general accordance with applicable ADEC regulation and guidance documents and the ADEC-approved work plan dated September 17, 2019 (RSE, 2019a). RSE collected one blind groundwater sample, RSE-X from RSE-3, as well as one blind analytical soil sample, RSE-X from RSE-7.

Some deviations from the ADEC-approved work plan occurred during the field efforts conducted at the ARRC Hurricane site from October 1-2, 2019. Groundwater samples were not collected from soil borings RSE-5, RSE-6 and RSE-7, as groundwater was not encountered at 3 feet bgs. Analytical soil samples from RSE-5, RSE-6 and RSE-7 were not collected at the soil/groundwater interface, as groundwater was never encountered. Additionally, RSE collected field-screening samples at soil borings RSE-8 and RSE-9, which was not part of the original scope. The deviations were reported to Mr. Grant Lidren, the ADEC project manager for the site. Mr. Lidren approved an amended scope to include the original scope and include collecting analytical samples from soil borings RSE-9 and RSE-10 (see Figure 2 in Attachment A for soil boring locations).

RSE remobilized to the site on October 17, 2019 to try and complete the amended scope of work at the site. RSE used an alternate method of drilling to install these soil borings deeper in attempts to identify and intersect the soil/groundwater interface. However, soil conditions at the site were anomalous and RSE did not observe the groundwater interface in soil borings RSE-5, RSE-6 or RSE-7. Boring RSE-5 was installed to nine (9) feet bgs, RSE-6 to five (5) feet bgs, and RSE-7 to six (6) feet bgs without groundwater infiltration observed. Since site conditions were limiting, soil lithology appeared to be anomalous, and the available equipment not appropriate for installing suitable monitoring wells in the soils observed, the ARRC representative on site (Russell Grandel) requested that all field efforts be suspended (including an attempt to sample at location RSE-9 and RSE-10) until next field season. The three (3) soil borings were backfilled with their own cuttings and RSE demobilized from the site.

All the tabulated laboratory data is usable for its intended purpose of comparison to ADEC Tables B1, B2 and C cleanup levels. Completed ADEC Laboratory Review Checklists for SGS Laboratory Reports (Attachment D) are found as Attachment E. RSE Field notes from both mobilizations are provided as Attachment F.

CONCLUSIONS AND RECOMMENDATIONS

During the 2019 field event, RSE installed three (3) vibratory drive soil borings (RSE-5, RSE-6 and RSE-7), collected field-screening and analytical soil samples from these soil borings and was unsuccessful in attempting to collect groundwater samples from them. RSE collected groundwater samples from all four existing wells (RSE-1, RSE-2, RSE-3 and RSE-4), and performed

a groundwater elevation survey for those four (4) wells. RSE advanced two (2) more vibratory drive soil borings (RSE-8 and RSE-9) and collected soil field-screening data from them, which was outside of the original scope of work outlined in the September 17, 2019 ADEC-approved work plan.

All results for the groundwater samples collected from monitoring wells RSE-1, RSE-2, RSE-3 and RSE-4 were either non-detect or below their ADEC Table C Groundwater cleanup levels. Groundwater samples were not able to be collected from soil borings RSE-5, RSE-6, RSE-7, RSE-8 or RSE-9 as explained in this report. RSE-8 and RSE-9 were only intended to provide additional soil data for the site. Absence of groundwater in soil borings RSE-5, RSE-6 and RSE-7 was possibly due to a smear effect as a result of soil boring installation efforts. A smear effect is the disturbance and smearing of soil, caused by soil boring installation resulting in sealing the soil boring walls from groundwater intrusion. Silt was observed in soil borings RSE-5, RSE-6 and RSE-7.

Analytical soil sample results indicate that hydrocarbon impacts are present downgradient from the four permanent monitoring wells. DRO results for soil borings RSE-6 and RSE-7 ranged up to 2,610 mg/Kg. Additionally, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, 1-methylnaphthalene and 2-methylnaphthalene results for soil boring RSE-7 were above applicable ADEC cleanup levels. Soil sample results from soil boring RSE-5 were either non-detect or below the MTG cleanup levels.

Field-screening results of soil borings RSE-8 and RSE-9 were higher than those collected from RSE-5, RSE-6 and RSE-7, indicating that hydrocarbon impacts at these locations may be elevated by comparison. RSE recommends installing three (3) permanent monitoring wells using GeoTek Alaska Inc. in the summer of 2020 to characterize the potential downgradient impacts at the Hurricane site. RSE recommends placing one (1) at the RSE-7 soil boring location, one (1) at the RSE-9 soil boring location, and one (1) approximately 40 feet to the west of RSE-9 (RSE-10). RSE recommends sampling these three new wells along with the four existing wells to evaluate groundwater contamination levels at these areas meet applicable ADEC Table C Groundwater cleanup levels.

Please contact Lisa Koeneman at (907) 278-1023 ext. 110, if you have any questions or comments. This report was prepared by an ADEC QEP in accordance with 18 AAC 75/78.

Lisa Koeneman, QEP Lucus Gamble, QEP, MSEM

Attachments:

Attachment A – Figures
Attachment B – Tabulated Laboratory Results
Attachment C – Select Site Photographs
Attachment D – SGS Laboratory Reports
Attachment E – Laboratory Data Quality Review Checklists
Attachment F – Field Notes

References:

Clarus Technologies, LLC (Clarus) 2010. Phase II Investigation Report, Hurricane Siding, Hurricane, Alaska. April 2010.

Clarus Technologies, LLC (Clarus) 2009. Work Plan for Soil Borings and Sampling, Hurricane Siding, Hurricane, Alaska. May 2009.

Fairbanks Environmental Services (FES). 2016a. 2016 Groundwater Monitoring Report Hurricane Siding Alaska Railroad Milepost 281.5, Alaska ADEC Hazard Id – 23545/File ID – 2258.26.008. August 22, 2016.

Fairbanks Environmental Services (FES). 2016b. 2015 Soil Removal Report, Rev 1.0 ARRC Hurricane Siding Alaska Railroad Milepost 281.5, Alaska ADEC Hazard Id – 23545/File ID 2258.26.008. January 13, 2016.

Fairbanks Environmental Services (FES). 2014. 2014 Groundwater Monitoring Report Hurricane Siding Alaska Railroad Milepost 281.35, Alaska ADEC Hazard ID – 23545/File ID – 2258.26.008. November 26, 2014.

Fairbanks Environmental Services (FES). 2013 Groundwater Monitoring Report Hurricane Siding Alaska Railroad Milepost 281.5, Alaska ADEC Hazard ID – 23545/File ID – 2258.26.008. September 30, 2013.

Restoration Science & Engineering, LLC (RSE). 2019a. Work Plan for ARRC 2019 Hurricane Groundwater Assessment at ARRC MP 281.4 Rev. 1.0 ADEC File # 2258.26.008. September 17, 2019.

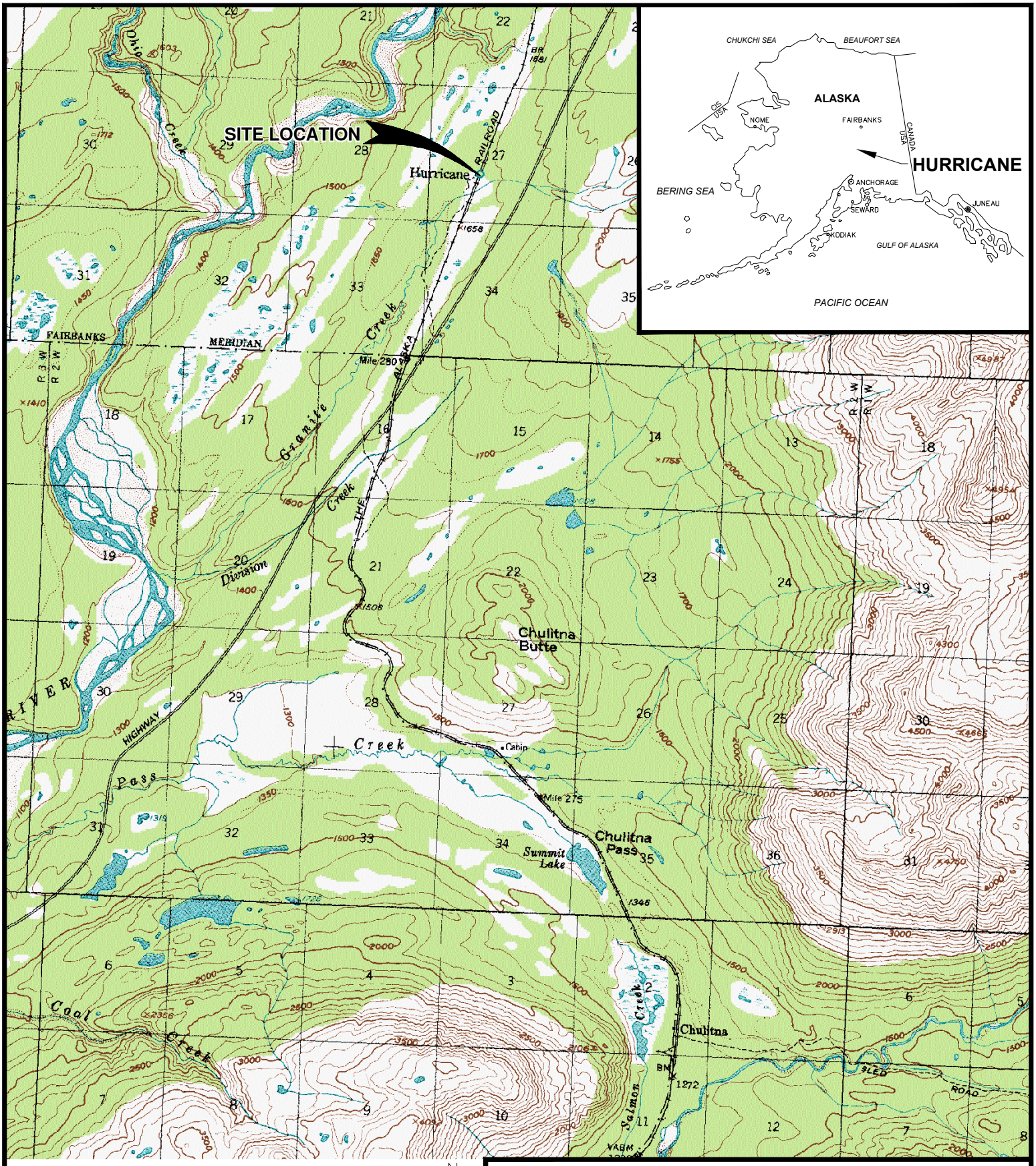
Restoration Science & Engineering, LLC (RSE). 2019b. Letter Report for Groundwater Sampling and Elevation Survey at ARRC MP 284.2. Hurricane Section, Alaska. ADEC File # 2258.26.008. Rev. 3.0. April 10, 2019.

Restoration Science & Engineering, LLC (RSE). 2017. Letter Report for Groundwater Sampling at ARRC MP Hurricane Section, Alaska. ADEC File # 2258.26.008. December 12, 2017.

Restoration Science & Engineering, LLC (RSE). 2011. Site Characterization Report ARRC Hurricane Siding. Alaska Railroad Milepost 281.5. Hurricane, Alaska. ADEC Hazard ID. ADEC File ID: 2258.26.008. November 2011.

Attachment A:

Figures



HURRICANE SECTION HOUSE

VICINITY MAP

HURRICANE, ALASKA

JOB NO: 19-2038	DRAWN: MB
DATE: 9.16.2019	CHECKED: LK

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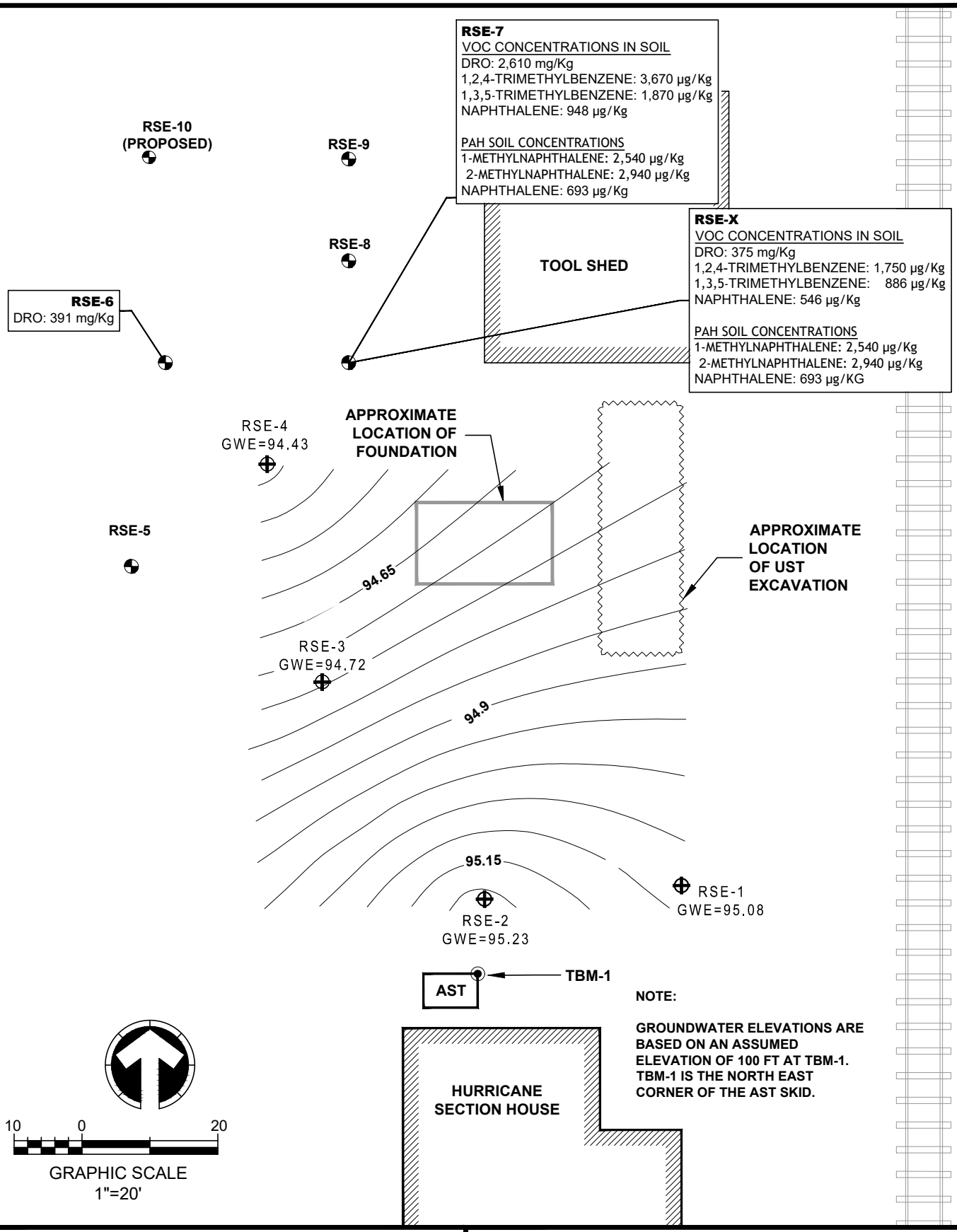
FIGURE 1



LEGEND

RSE-1 ⊕	APPROXIMATE LOCATION OF MONITORING WELL
RSE-6 ⊕	SOIL BORING LOCATION
GWE	WELL ELEVATION

HURRICANE SECTION HOUSE

SITE PLAN

HURRICANE, ALASKA

JOB NO: 19.2038	DRAWN: MSB
DATE: 12.17.2019	CHECKED: LK

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FIGURE 2

Attachment B:

Tabulated Laboratory Results

RESTORATION
Science & Engineering, LLC

TABLE 1
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
FIELD SCREENING RESULTS

FIELD SCREENING RESULTS					
SOIL BORING	**SAMPLE ID**	**DATE**	**SAMPLE DEPTH (FEET)**	**PID RESULTS (PPMV)**	**DESCRIPTION**
RSE-5	**RSE-5**	**10/1/2019**	**1-3**	**3.1**	**MOIST, LIGHT GRAY TO ORANGE SILT WITH SOME SAND**
	RSE-5A	10/17/2019	1-3	0.5	MOIST BROWN SILT WITH SOME SAND
	RSE-5B	10/17/2019	6-8	0.7	WET COARSE SAND WITH SILT
	RSE-5C	10/17/2019	8-9	0.5	LIGHT GRAY SILT WITH SOME SAND
RSE-6	**RSE-6**	**10/1/2019**	**1-3**	**6.5**	**LIGHT GRAY SILT WITH SOME SAND**
	RSE-6A	10/17/2019	1-3	3.4	LIGHT GRAY SILT WITH SOME SAND
	RSE-6B	10/17/2019	3-6	1.5	MOIST, LIGHT GRAY TO TAN COARSE SAND WITH GRAVEL
RSE-7	**RSE-7**	**10/1/2019**	**1-3**	**114.8**	**MOIST GRAY SILT WITH SOME SAND**
	RSE-7A	10/17/2019	1-3	108.2	MOIST GRAY SILT WITH SOME SAND
	RSE-7B	10/17/2019	3-6	56.5	MOIST GRAY SILT WITH SOME SAND
RSE-8	RSE-8	10/1/2019	1-3	189.4	MOIST LIGHT GRAY SILT WITH COARSE SAND
RSE-9	RSE-9	10/1/2019	1-3	1271	MOIST LIGHT GRAY SILT WITH COARSE SAND

NOTES:

1) Field-screening measurements collected with a RAE Systems MiniRAE Lite photo-ionization detector (PID) calibrated with 100 ppmv isobutylene.

2) "PPMV" means "parts per million by volume."

3) Bold text indicates the sample was submitted for laboratory analyses.

TABLE 2
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
HYDROCARBONS IN SOIL

HYDROCARBON CONCENTRATIONS IN SOIL								
SAMPLE ID	DATE	SAMPLE DEPTH (FEET)	PID RESULTS (PPMV)	TOTAL SOLIDS (%)	DIESEL RANGE ORGANICS (mg/Kg)	RESIDUAL RANGE ORGANICS (mg/Kg)	GASOLINE RANGE ORGANICS (mg/Kg)	SGS WORK ORDER
RSE-5	**10/01/19**	**1-3**	**3.1**	**74.7**	**19.0 J**	**80.2**	*3.12 U*	1195932
RSE-6	**10/01/19**	**1-3**	**6.5**	**78.2**	**391**	**80.2**	*3.40 U*	
RSE-7	**10/01/19**	**1-3**	**114.8**	**91.5**	**2610**	**108**	**140**	
RSE-X	**10/01/19**	**1-3**	**114.8**	**93.1**	**375**	**145**	**73.8**	
ADEC TABLE B2 METHOD 2 MIGRATION TO GROUNDWATER CLEANUP LEVELS (18 AAC 75)					**250**	**11000**	**300**	

NOTES:

1) Diesel Range Organics analyses by Method AK 102 ; Gasoline Range Organics analyses by Method AK 101; Residual Range Organics analyses by Method AK103.

2) Bold font indicates that concentrations were detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; value given is the limit of detection.

4) J flag indicates that the result is an estimated value .

5) "PPMV" = "parts per million by volume;" "mg/Kg" = "miligrams per kilogram."

6) Yellow highlighting indicates that the analyte was detected above the ADEC cleanup level.

7) RSE-X is a blind duplicate of RSE-7.

TABLE 3
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
VOLATILE ORGANIC COMPOUND CONCETRATIONS IN SOIL

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN SOIL					
SAMPLE ID	**RSE-5**	**RSE-6**	**RSE-7**	**RSE-X**	**ADEC METHOD 2**
DATE	**10/01/19**	**10/01/19**	**10/01/19**	**10/01/19**	**TABLE B1 MIGRATION**
SAMPLE DEPTH (FEET)	**1-3**	**1-3**	**1-3**	**1-3**	**TO GROUNDWATER**
SGS WORK ORDER	**1195932**	**1195932**	**1195932**	**1195932**	**SOIL CLEANUP LEVELS**
UNITS	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**(ug/Kg)**
1,2,4-Trimethylbenzene	*62.5 U*	*68.0 U*	**3670**	**1750**	610
1,2-Dibromoethane	*1.25 U*	*1.36 U*	*10.3 U*	*8.40 U*	0.24
1,2-Dichloroethane	*2.50 U*	*2.72 U*	*20.5 U*	*16.8 U*	5.5
1,3,5-Trimethylbenzene	*31.2 U*	*34.0 U*	**1870**	**886**	660
Benzene	*15.6 U*	*17.0 U*	*128 U*	*105 U*	22
Ethylbenzene	*31.2 U*	*34.0 U*	*256 U*	*210 U*	130
Isopropylbenzene (Cumene)	*31.2 U*	*34.0 U*	**225 J**	*210 U*	5600
Methyl-t-butyl ether	*125 U*	*136 U*	*1025 U*	*840 U*	400
Naphthalene	*31.2 U*	*34.0 U*	**948**	**546**	38
P & M -Xylene	*62.5 U*	*68.0 U*	*510 U*	*420 U*	See total Xylenes
Toluene	*31.2 U*	*34.0 U*	*256 U*	*210 U*	6700
Xylenes (total)	*93.5 U*	*102 U*	*770 U*	*630 U*	1500
n-Butylbenzene	*31.2 U*	*34.0 U*	*256 U*	*210 U*	23000
o-Xylene	*31.2 U*	*34.0 U*	*256 U*	*210 U*	See total Xylenes
sec-Butylbenzene	*31.2 U*	*34.0 U*	**814**	**424**	42000
tert-Butylbenzene	*31.2 U*	*34.0 U*	*256 U*	*210 U*	11000

NOTES:

1) Volatile Organic Compounds analyses by Method EPA SW8260D.

2) Bold font indicates that concentrations were detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; value given is the limit of detection.

4) J flag indicates that the result is an estimated value .

5) Blue highlighting indicates that the DL is elevated above the cleanup level.

6) Yellow highlighting indicates that the analyte was detected above the ADEC cleanup level.

7) "ug/Kg" = "micrograms per kilogram."

8) RSE-X is a blind duplicate of RSE-7.

TABLE 4
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
POLYCYCLIC AROMATIC HYDROCARBONS BY SELECT ION MONITORING CONCENTRATIONS IN SOIL

POLYCYCLIC AROMATIC HYDROCARBONS BY SELECT ION MONITORING CONCENTRATIONS IN SOIL					
SAMPLE NUMBER	**RSE-5**	**RSE-6**	**RSE-7**	**RSE-X**	
DATE	**10/01/19**	**10/01/19**	**10/01/19**	**10/01/19**	**ADEC TABLE B2 METHOD 2**
SAMPLE DEPTH (FEET)	**01/03/19**	**1-3**	**1-3**	**1-3**	**MIGRATION TO**
SGS WORK ORDER	**1195932**	**1195932**	**1195932**	**1195932**	**GROUNDWATER (ug/Kg)**
UNITS	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	
1-Methylnaphthalene	*16.8 U*	*15.9 U*	**2540**	**357**	330
2-Methylnaphthalene	*16.8 U*	*15.9 U*	**2940**	**391**	410
Acenaphthene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	37,000
Acenaphthylene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	18,000
Benzo(a)Anthracene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	700
Benzo[a]pyrene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	1,900
Benzo[b]Fluoranthene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	190,000
Benzo[g,h,i]perylene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	15,000,000
Benzo[k]fluoranthene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	190,000
Chrysene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	600,000
Dibenzo[a,h]anthracene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	6,300
Fluoranthene	*16.8 U*	*15.9 U*	*13.7 U*	*14.2 J*	590,000
Fluorene	*16.8 U*	*15.9 U*	**271**	**48.2**	36,000
Indeno[1,2,3-c,d] pyrene	*16.8 U*	*15.9 U*	*13.7 U*	*13.4 U*	65,000
Naphthalene	*13.4 U*	*12.8 U*	**693**	**103**	38
Phenanthrene	*16.8 U*	*15.9 U*	**309**	**62.4**	39,000
Pyrene	*16.8 U*	*15.9 U*	**20.2 J**	**13.8 J**	87,000

NOTES:

1) Polycyclic aromatic hydrocarbons by Select Ion Monitoring analyses by EPA 8270D.

2) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) Yellow highlighting indicates that the analyte was detected above the ADEC cleanup level.

6) "ug/Kg" means "micrograms per kilogram".

7) RSE-X is a blind duplicate of RSE-7.

TABLE 5
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
GROUNDWATER QUALITY FIELD PARAMETERS

GROUNDWATER QUALITY FIELD PARAMETERS											
SAMPLE ID	**DATE**	**MEASURING POINT ELEVATION**	**DEPTH TO WATER (feet)**	**DEPTH TO BOTTOM (feet)**	**VOLUME PURGED (gal)**	**TEMP (°C)**	**pH (pH Units)**	**CONDUCTIVITY (mS/cm)**	**SPECIFIC CONDUCTANCE (µS/cm)**	**DISSOLVED OXYGEN %**	**OBSERVATIONS**
RSE-1	10/1/2019	99.45	4.37	7.94	3	9.5 9.6 9.5	5.3 5.29 5.28	22.8 24.2 22.9	0.952 0.948 0.950	7.80 7.95 8.05	CLEAR, LITTLE TO NO TURBIDITY, NO SHEEN OR ODOR
RSE-2	10/1/2019	99.39	4.16	7.19	3	9.0 9.1 9.0	6.40 6.41 6.45	30.4 33.2 32.8	0.102 0.107 0.107	6.52 6.5 6.48	MOSTLY CLEAR, SLIGHTLY TURBID, SOME SMALL WHITE PARTICULATES, NO SHEEN OR ODOR
RSE-3	10/1/2019	98.11	3.39	7.85	3	8.4 8.5 8.5	6.92 6.95 6.99	45.2 48.7 46.5	0.075 0.078 0.081	9.52 9.58 9.58	MOSTLY CLEAR, LITTLE TO NO TURBIDITY, SOME SMALL WHITE PARTICULATES, NO SHEEN OR ODOR
RSE-4	10/1/2019	95.99	1.56	5.94	3	5.95 5.96 5.96	6.05 6.08 6.10	100 102 103	0.115 0.117 0.117	6.05 6.07 6.08	MOSTLY CLEAR, LITTLE TO NO TURBIDITY, SOME SMALL WHITE PARTICULATES, NO SHEEN OR ODOR

NOTES:

1) Water quality measurements performed using a YSI Model 556 Water Quality Meter.

2) Purging of well was done with a positive pressure submersible pump for RSE-1, RSE-3, and RSE-4, and a peristaltic pump for RSE-2.

3) "mS/cm" means "millisiemens per centimeter"; "µS/cm" means "micro Siemens per centimeter"; "ppt" means "parts per thousand"; "mV" means "millivolts"; "mg/L" means "milligram per liter"; "gal" means "gallon"; "°C " means "degrees Celsius".

TABLE 6
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
HYDROCARBON CONCENTRATIONS IN GROUNDWATER

HYDROCARBON CONCENTRATIONS IN GROUNDWATER					
SAMPLE ID	**DATE**	**DIESEL RANGE ORGANICS (mg/L)**	**RESIDUAL RANGE ORGANICS mg/L**	**GASOLINE RANGE ORGANICS (mg/L)**	**SGS WORK ORDER**
RSE-1	10/1/2019	**0.268 J**	**0.393 J**	*0.0500 U*	
RSE-2	10/1/2019	**0.288 J**	**0.194 J**	*0.0500 U*	
RSE-3	10/1/2019	**1.18**	**.0375 J**	*0.0500 U*	1195932
RSE-4	10/1/2019	**0.515 J**	**0.278 J**	*0.0500 U*	
RSE-X	10/1/2019	**0.534 J**	**0.397 J**	*0.0500 U*	
ADEC TABLE C GROUNDWATER CLEANUP LEVELS (18 AAC 75)		**1.5**	**1.1**	**2.2**	

NOTES:

1) Diesel Range Organics (DRO) samples analyzed by AK Method 102;
Residual Range Organics (RRO) samples analyzed by AK Method 103;
Gasoline Range Organics (GRO) samples analyzed by AK Method 101.

2) Bold font indicates the analyte was detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "mg/L" means "milligrams per liter".

6) RSE-X is a blind duplicate of RSE-4.

TABLE 7
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER						
SAMPLE ID	**RSE-1**	**RSE-2**	**RSE-3**	**RSE-4**	**RSE-X**	**ADEC TABLE C**
Date	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	**GROUNDWATER**
SGS Work Order	1195932	1195932	1195932	1195932	1195932	**CLEANUP LEVELS**
Units	ug/L	ug/L	ug/L	ug/L	ug/L	**(µg/L)**
1,2,4-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	**1.5**	**0.743 J**	56
1,2-Dibromoethane	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	0.075
1,2-Dichloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.7
1,3,5-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	60
Benzene	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	4.6
Ethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	15
Isopropylbenzene (Cumene)	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	450
Methyl-t-butyl ether	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	140
Naphthalene	*0.500 U*	*0.500 U*	*0.500 U*	**0.968 J**	**0.524 J**	1.7
n-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,000
o-Xylene	*0.500 U*	*0.500 U*	*0.500 U*	**0.416 J**	*0.500 U*	See Total Xylenes
P & M -Xylene	*1.00 U*	*1.00 U*	*1.00 U*	*1.00 U*	*1.00 U*	See Total Xylenes
sec-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	2,000
tert-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	690
Toluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,100
Xylenes (total)	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	190

NOTES:

1) Volatile organic compounds analyses by Method EPA SW8260C.

2) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "ug/L" means "micrograms per liter".

6) RSE-X is a blind duplicate of RSE-4.

TABLE 8
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
POLYCYCLIC AROMATIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER

POLYCYCLIC AROMATIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER						
SAMPLE NUMBER **DATE** **SGS WORK ORDER** **UNITS**	**RSE-1** **10/1/2019** **1195932** **ug/L**	**RSE-2** **10/1/2019** **1195932** **ug/L**	**RSE-3** **10/1/2019** **1195932** **ug/L**	**RSE-4** **10/1/2019** **1195932** **ug/L**	**RSE-X** **10/1/2019** **1195932** **ug/L**	**ADEC TABLE C CLEANUP LEVELS (ug/L)**
1-Methylnaphthalene	*0.0232 U*	*0.0240 U*	*0.0245 U*	**0.226**	**0.136**	11
2-Methylnaphthalene	*0.0232 U*	*0.0240 U*	*0.0245 U*	**0.113**	**0.0725**	
Acenaphthene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	530
Acenaphthylene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	260
Anthracene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	43(1800)[4]
Benzo(a)Anthracene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	--
Benzo[a]pyrene	*0.00925 U*	*0.00960 U*	*0.00980 U*	*0.0102 U*	*0.00945 U*	0.25
Benzo[b]Fluoranthene	*0.0232 U*	*0.0240 U*	*0.00245 U*	*0.0255 U*	*0.02345 U*	2.5
Benzo[g,h,i]perylene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0235 U*	0.26(600)[4]
Benzo[k]fluoranthene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	0.80(25)[4]
Chrysene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	2.0(250)[4]
Dibenzo[a,h]anthracene	*0.00925 U*	*0.00960 U*	*0.00980 U*	*0.0102 U*	*0.00945 U*	0.25
Fluoranthene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	260(800)[4]
Fluorene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	290
Indeno[1,2,3-c,d] pyrene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	0.19
Naphthalene	*0.0463 U*	*0.0481 U*	*0.0490 U*	**0.28**	**0.187**	1.7
Phenanthrene	*0.0232 U*	*0.0240 U*	*0.0245 U*	*0.0255 U*	*0.0236 U*	170
Pyrene	*0.0232 U*	*0.0240 U*	*0.0.245 U*	*0.0255 U*	**0.0318 J**	120

NOTES:

1) Polycyclic aromatic hydrocarbons by Select ion Monitoring analyses by EPA 8270D.

2) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the detection limit; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "ug/L" means "micrograms per liter".

6) RSE-X is a blind duplicate of RSE-4.

TABLE 9
ALASKA RAILROAD CORPORATION
HURRICANE GW MONITORING 2019
HISTORIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER

HISTORIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER						
SAMPLE ID	**DATE**	**SAMPLE TYPE (Primary or Duplicate)**	**DIESEL RANGE ORGANICS (mg/L)**	**RESIDUAL RANGE ORGANICS mg/L**	**GASOLINE RANGE ORGANICS (mg/L)**	**NAPHTHALENE (ug/L)**
RSE-1						
RSE-1	9/9/2011	Primary	*ND (0.3)*	*ND (0.3)*	*ND (0.06)*	--
RSE-1	9/14/2012	Primary/Duplicate	*ND (0.34)/ND (0.362)*	*ND (0.34)/ND (0.434)*	*ND (0.062)/ ND(0.062)*	--
RSE-1	6/12/2013	Primary	**0.323 J**	**0.567**	*ND (0.062)*	--
RSE-1	9/26/2014	Primary	*ND (0.310)*	*ND (0.259)*	*ND (0.05)*	--
RSE-1	7/7/2016	Primary	*ND(0.300)*	**0.255 J**	*ND(0.05)*	--
RSE-1	8/24/2017	Primary	**0.351 J**	**0.539**	*0.0500 U*	--
RSE-1	9/28/2018	Primary	*0.288 U*	*0.240 U*	*0.500 U*	*0.500 U*
RSE-1	10/1/2019	Primary	**0.268 J**	**0.393 J**	*0.0500 U*	*0.500 U*
RSE-2						
RSE-2	9/9/2011	Primary	**0.311 J**	*ND (0.3)*	*ND (0.06)*	--
RSE-2	9/14/2012	Primary	*ND (0.36)*	*ND (0.3)*	*ND (0.062)*	--
RSE-2	6/13/2013	Primary	**0.237 J**	**0.388**	*ND (0.062)*	--
RSE-2	9/26/2014	Primary	*ND (0.308)*	*ND (0.256)*	*ND (0.05)*	--
RSE-2	7/7/2016	Primary	**0.200 J**	**0.277 J**	*ND(0.05)*	--
RSE-2	8/24/2017	Primary	**0.692**	**0.889**	*0.0500 U*	--
RSE-2	9/28/2018	Primary	*0.278 U*	*0.232 U*	*0.500 U*	*0.500 U*
RSE-2	10/1/2019	Primary	**0.288 J**	**0.194 J**	*0.0500 U*	*0.500 U*
RSE-3						
RSE-3	9/9/2011	Primary/Duplicate	**0.498 J/ 0.431 J**	*ND (0.3)/ND (0.3)*	*ND (0.06)/ ND (0.06)*	--
RSE-3	9/14/2012	Primary	**0.779**	*ND (0.3)*	*ND (0.062)*	--
RSE-3	6/13/2013	Primary	**5.51**	**1.34**	*ND (0.062)*	--
RSE-3	9/26/2014	Primary/Duplicate	**1.88/1.57**	**0.330 J/0.252 J**	*ND (0.05)/ ND (0.05)*	--
RSE-3	7/7/2016	Primary	**0.343 J**	**0.263 J**	**0.0541 J**	**--**
RSE-3	8/24/2017	Primary/Duplicate	**1.95/ 1.82**	**0.735/ 0.686**	*0.0500 / 0.0500 U*	--
RSE-3	9/28/2018	Primary/Duplicate	**1.42/1.86**	**0.156 J/0.252 J**	**0.349***/0.050 U*	**0.870 J/0.620 J**
RSE-3	10/1/2019	Primary	**1.18**	**0.375 J**	*0.0500 U*	*0.500 U*
RSE-4						
RSE-4	9/9/2011	Primary	**1.52**	*ND (0.3)*	**0.0833 J**	**--**
RSE-4	9/14/2012	Primary	**0.601 J**	*ND (0.338)*	*0.0456 J*	--
RSE-4	6/12/2013	Primary/Duplicate	**0.425 J/0.385 J**	**0.252 J/ 0.385 J**	**0.0341 J***/ ND (0.062)*	--
RSE-4	9/26/2014	Primary	**0.58 J**	**0.580 J**	*ND (0.05)*	--
RSE-4	7/7/2016	Primary/Duplicate	**0.885/0.828**	**0.268 J/0.215 J**	**0.0541 J/0.0459 J**	--
RSE-4	8/24/2017	Primary	**1.36**	**0.734**	--	**3.08**
RSE-4	9/28/2018	Primary	**2.73**	**0.277 J**	**0.0701 J**	**6.63**
RSE-4	10/1/2019	Primary	**0.515 J/0.534 J**	**0.278 J/0.397 J**	*0.0500 U/0.0500 U*	**0.968 J/0.542 J**
ADEC GROUNDWATER CLEANUP LEVELS TABLE C (18 AAC 75)			**1.5**	**1.1**	**2.2**	**1.7**

NOTES:

1) Diesel range organics samples analyzed by AK Method 102; Residual range organics samples analyzed by AK Method 103; Gasoline range organics samples analyzed by AK Method 101; Naphthalene samples analyzed by EPA Method 8260C.

2) Bold font indicates the analyte was detected above the detection limit (DL).

3) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; the value presented is the limit of detection.

4) J flag indicates the result is an estimated value.

5) "mg/L" means "milligrams per liter".

6) Yellow highlighting indicates the analyte was detected above the ADEC Table C Groundwater Cleanup Level.

Attachment C:

Select Site Photographs

RESTORATION
Science & Engineering, LLC

RSE-1, looking north

RSE-2, looking north

RSE-3, looking northwest

Sampling at RSE-4, looking north

Installing piezo for groundwater sampling at RSE-5, looking southwest

Attempting to sample groundwater at RSE-6

Installing soil boring RSE-8, RSE-7 in foreground, looking south

Installing soil boring RSE-9, looking south

Attachment D:
SGS North America Laboratory Report

RESTORATION
Science & Engineering, LLC

Laboratory Report of Analysis

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501
(907)278-1023

Report Number: **1195932**

Client Project: **19-2038 - ARRC Hurricane**

Dear Lisa Koeneman,

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 Chuck 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.

Chuck Homestead Date
Project Manager
Charles.Homestead@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

Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1195932**
Project Name/Site: **19-2038 - ARRC Hurricane**
Project Contact: **Lisa Koeneman**

Refer to sample receipt form for information on sample condition.

RSE-7 (1195932008) PS

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

RSE-X (1195932009) PS

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

LCSD for HBN 1800656 [VXX/3504 (1537362) LCSD

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria however it passes within criteria in the associated samples.

LCSD for HBN 1800864 [VXX/3507 (1538116) LCSD

8260C - LCSD recovery for methyl-t-butyl ether does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.
8260C - LCS/LCSD RPD for methyl-t-butyl ether does not meet QC criteria. This analyte was 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 associated field samples.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1195932008	RSE-7	XMS11790	Naphthalene	SP
1195932008	RSE-7	XMS11788	Phenanthrene	BLC
1195932009	RSE-X	XMS11788	Phenanthrene	BLC
SW8260C				
1195932008	RSE-7	VMS19535	Naphthalene	RP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification, and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
RSE-1	1195932001	10/01/2019	10/03/2019	Water (Surface, Eff., Ground)
RSE-2	1195932002	10/01/2019	10/03/2019	Water (Surface, Eff., Ground)
RSE-3	1195932003	10/01/2019	10/03/2019	Water (Surface, Eff., Ground)
RSE-4	1195932004	10/01/2019	10/03/2019	Water (Surface, Eff., Ground)
RSE-X	1195932005	10/01/2019	10/03/2019	Water (Surface, Eff., Ground)
RSE-5	1195932006	10/01/2019	10/03/2019	Soil/Solid (dry weight)
RSE-6	1195932007	10/01/2019	10/03/2019	Soil/Solid (dry weight)
RSE-7	1195932008	10/01/2019	10/03/2019	Soil/Solid (dry weight)
RSE-X	1195932009	10/01/2019	10/03/2019	Soil/Solid (dry weight)
Trip Blank	1195932010	10/01/2019	10/03/2019	Soil/Solid (dry weight)
Trip Blank	1195932011	10/01/2019	10/03/2019	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS Liq/Liq ext. LV
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (S)
AK101	Gasoline Range Organics (W)
SM21 2540G	Percent Solids SM2540G
SW8260C	VOC 8260 (S) Field Extracted
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **RSE-1**
Lab Sample ID: 1195932001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.268J	mg/L
	Residual Range Organics	0.393J	mg/L

Client Sample ID: **RSE-2**
Lab Sample ID: 1195932002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.288J	mg/L
	Residual Range Organics	0.194J	mg/L

Client Sample ID: **RSE-3**
Lab Sample ID: 1195932003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.18	mg/L
	Residual Range Organics	0.375J	mg/L

Client Sample ID: **RSE-4**
Lab Sample ID: 1195932004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.226	ug/L
	2-Methylnaphthalene	0.133	ug/L
	Naphthalene	0.280	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.515J	mg/L
	Residual Range Organics	0.278J	mg/L
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	1.50	ug/L
	Naphthalene	0.968J	ug/L
	o-Xylene	0.416J	ug/L

Client Sample ID: **RSE-X**
Lab Sample ID: 1195932005

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.136	ug/L
	2-Methylnaphthalene	0.0725	ug/L
	Naphthalene	0.187	ug/L
	Pyrene	0.0318J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.534J	mg/L
	Residual Range Organics	0.397J	mg/L
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	0.743J	ug/L
	Naphthalene	0.524J	ug/L

Client Sample ID: **RSE-5**
Lab Sample ID: 1195932006

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	19.0J	mg/Kg
	Residual Range Organics	80.2	mg/Kg

Client Sample ID: **RSE-6**
Lab Sample ID: 1195932007

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	391	mg/Kg
	Residual Range Organics	80.2	mg/Kg

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Detectable Results Summary

Client Sample ID: **RSE-7**
Lab Sample ID: 1195932008

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	2540	ug/Kg
	2-Methylnaphthalene	2940	ug/Kg
	Fluorene	271	ug/Kg
	Naphthalene	693	ug/Kg
	Phenanthrene	309	ug/Kg
	Pyrene	20.2J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	2610	mg/Kg
	Residual Range Organics	108	mg/Kg
Volatile Fuels	Gasoline Range Organics	140	mg/Kg
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	3670	ug/Kg
	1,3,5-Trimethylbenzene	1870	ug/Kg
	Isopropylbenzene (Cumene)	225J	ug/Kg
	Naphthalene	948	ug/Kg
	sec-Butylbenzene	814	ug/Kg

Client Sample ID: **RSE-X**
Lab Sample ID: 1195932009

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	357	ug/Kg
	2-Methylnaphthalene	391	ug/Kg
	Chrysene	14.0J	ug/Kg
	Fluoranthene	14.2J	ug/Kg
	Fluorene	48.2	ug/Kg
	Naphthalene	103	ug/Kg
	Phenanthrene	62.4	ug/Kg
	Pyrene	13.8J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	375	mg/Kg
	Residual Range Organics	145	mg/Kg
Volatile Fuels	Gasoline Range Organics	73.8	mg/Kg
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	1750	ug/Kg
	1,3,5-Trimethylbenzene	886	ug/Kg
	Naphthalene	546	ug/Kg
	sec-Butylbenzene	424	ug/Kg

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932001
Lab Project ID: 1195932

Collection Date: 10/01/19 13:00
Received Date: 10/03/19 12:14
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	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
2-Methylnaphthalene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Acenaphthene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Acenaphthylene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Anthracene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Benzo(a)Anthracene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Benzo[a]pyrene	0.00925	U	0.0185	0.00574	ug/L	1		10/10/19 18:23
Benzo[b]Fluoranthene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Benzo[g,h,i]perylene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Benzo[k]fluoranthene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Chrysene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Dibenzo[a,h]anthracene	0.00925	U	0.0185	0.00574	ug/L	1		10/10/19 18:23
Fluoranthene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Fluorene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Indeno[1,2,3-c,d] pyrene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Naphthalene	0.0463	U	0.0926	0.0287	ug/L	1		10/10/19 18:23
Phenanthrene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Pyrene	0.0232	U	0.0463	0.0139	ug/L	1		10/10/19 18:23
Surrogates								
2-Methylnaphthalene-d10 (surr)	63.8		47-106		%	1		10/10/19 18:23
Fluoranthene-d10 (surr)	67.1		24-116		%	1		10/10/19 18:23

Batch Information

Analytical Batch: XMS11793
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 18:23
Container ID: 1195932001-C

Prep Batch: XXX42406
Prep Method: SW3520C
Prep Date/Time: 10/06/19 09:45
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932001
Lab Project ID: 1195932

Collection Date: 10/01/19 13:00
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.268	J	0.600	0.180	mg/L	1		10/15/19 05:31
Surrogates								
5a Androstane (surr)	100		50-150		%	1		10/15/19 05:31

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/15/19 05:31
Container ID: 1195932001-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.393	J	0.500	0.150	mg/L	1		10/15/19 05:31
Surrogates								
n-Triacontane-d62 (surr)	101		50-150		%	1		10/15/19 05:31

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/15/19 05:31
Container ID: 1195932001-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932001
Lab Project ID: 1195932

Collection Date: 10/01/19 13:00
Received Date: 10/03/19 12:14
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		10/08/19 18:48
Surrogates								
4-Bromofluorobenzene (surr)	89.2		50-150		%	1		10/08/19 18:48

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 18:48
Container ID: 1195932001-E

Prep Batch: VXX35047
Prep Method: SW5030B
Prep Date/Time: 10/08/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932001
Lab Project ID: 1195932

Collection Date: 10/01/19 13:00
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		10/14/19 17:29
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/12/19 06:26
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
Benzene	0.200	U	0.400	0.120	ug/L	1		10/12/19 06:26
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/12/19 06:26
Naphthalene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/12/19 06:26
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
Toluene	0.500	U	1.00	0.310	ug/L	1		10/12/19 06:26
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/12/19 06:26
Surrogates								
1,2-Dichloroethane-D4 (surr)	114		81-118		%	1		10/12/19 06:26
4-Bromofluorobenzene (surr)	102		85-114		%	1		10/12/19 06:26
Toluene-d8 (surr)	99.4		89-112		%	1		10/12/19 06:26

Batch Information

Analytical Batch: VMS19556
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 10/12/19 06:26
Container ID: 1195932001-H

Prep Batch: VXX35070
Prep Method: SW5030B
Prep Date/Time: 10/11/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19567
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 10/14/19 17:29
Container ID: 1195932001-F

Prep Batch: VXX35092
Prep Method: SW5030B
Prep Date/Time: 10/14/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932002
Lab Project ID: 1195932

Collection Date: 10/01/19 13:30
Received Date: 10/03/19 12:14
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	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		10/10/19 18:44
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		10/10/19 18:44
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Naphthalene	0.0481	U	0.0962	0.0298	ug/L	1		10/10/19 18:44
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		10/10/19 18:44
Surrogates								
2-Methylnaphthalene-d10 (surr)	61.7		47-106		%	1		10/10/19 18:44
Fluoranthene-d10 (surr)	66.2		24-116		%	1		10/10/19 18:44

Batch Information

Analytical Batch: XMS11793
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 18:44
Container ID: 1195932002-C

Prep Batch: XXX42406
Prep Method: SW3520C
Prep Date/Time: 10/06/19 09:45
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932002
Lab Project ID: 1195932

Collection Date: 10/01/19 13:30
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.288	J	0.566	0.170	mg/L	1		10/15/19 05:40
Surrogates								
5a Androstane (surr)	93.9		50-150		%	1		10/15/19 05:40

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/15/19 05:40
Container ID: 1195932002-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.194	J	0.472	0.142	mg/L	1		10/15/19 05:40
Surrogates								
n-Triacontane-d62 (surr)	95.7		50-150		%	1		10/15/19 05:40

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/15/19 05:40
Container ID: 1195932002-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932002
Lab Project ID: 1195932

Collection Date: 10/01/19 13:30
Received Date: 10/03/19 12:14
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		10/08/19 20:16
Surrogates								
4-Bromofluorobenzene (surr)	81.4		50-150		%	1		10/08/19 20:16

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 20:16
Container ID: 1195932002-E

Prep Batch: VXX35047
Prep Method: SW5030B
Prep Date/Time: 10/08/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932002
Lab Project ID: 1195932

Collection Date: 10/01/19 13:30
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		10/14/19 14:41
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/11/19 23:52
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
Benzene	0.200	U	0.400	0.120	ug/L	1		10/11/19 23:52
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/11/19 23:52
Naphthalene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/11/19 23:52
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
Toluene	0.500	U	1.00	0.310	ug/L	1		10/11/19 23:52
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/11/19 23:52
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		10/11/19 23:52
4-Bromofluorobenzene (surr)	101		85-114		%	1		10/11/19 23:52
Toluene-d8 (surr)	101		89-112		%	1		10/11/19 23:52

Batch Information

Analytical Batch: VMS19567
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 10/14/19 14:41
Container ID: 1195932002-H

Prep Batch: VXX35092
Prep Method: SW5030B
Prep Date/Time: 10/14/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19556
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 10/11/19 23:52
Container ID: 1195932002-F

Prep Batch: VXX35070
Prep Method: SW5030B
Prep Date/Time: 10/11/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932003
Lab Project ID: 1195932

Collection Date: 10/01/19 14:00
Received Date: 10/03/19 12:14
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	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		10/10/19 19:04
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		10/10/19 19:04
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		10/10/19 19:04
Phenanthrene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		10/10/19 19:04
Surrogates								
2-Methylnaphthalene-d10 (surr)	56.8		47-106		%	1		10/10/19 19:04
Fluoranthene-d10 (surr)	57.8		24-116		%	1		10/10/19 19:04

Batch Information

Analytical Batch: XMS11793
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 19:04
Container ID: 1195932003-C

Prep Batch: XXX42406
Prep Method: SW3520C
Prep Date/Time: 10/06/19 09:45
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932003
Lab Project ID: 1195932

Collection Date: 10/01/19 14:00
Received Date: 10/03/19 12:14
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	1.18		0.612	0.184	mg/L	1		10/15/19 05:50
Surrogates								
5a Androstane (surr)	91.5		50-150		%	1		10/15/19 05:50

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/15/19 05:50
Container ID: 1195932003-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.375	J	0.510	0.153	mg/L	1		10/15/19 05:50
Surrogates								
n-Triacontane-d62 (surr)	91.2		50-150		%	1		10/15/19 05:50

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/15/19 05:50
Container ID: 1195932003-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932003
Lab Project ID: 1195932

Collection Date: 10/01/19 14:00
Received Date: 10/03/19 12:14
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		10/08/19 19:06
Surrogates								
4-Bromofluorobenzene (surr)	84		50-150		%	1		10/08/19 19:06

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 19:06
Container ID: 1195932003-E

Prep Batch: VXX35047
Prep Method: SW5030B
Prep Date/Time: 10/08/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932003
Lab Project ID: 1195932

Collection Date: 10/01/19 14:00
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		10/14/19 08:02
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/13/19 06:24
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
Benzene	0.200	U	0.400	0.120	ug/L	1		10/13/19 06:24
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/13/19 06:24
Naphthalene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/13/19 06:24
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
Toluene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:24
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/13/19 06:24
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		10/13/19 06:24
4-Bromofluorobenzene (surr)	105		85-114		%	1		10/13/19 06:24
Toluene-d8 (surr)	99.5		89-112		%	1		10/13/19 06:24

Batch Information

Analytical Batch: VMS19559
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/13/19 06:24
Container ID: 1195932003-H

Prep Batch: VXX35073
Prep Method: SW5030B
Prep Date/Time: 10/12/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19563
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/14/19 08:02
Container ID: 1195932003-F

Prep Batch: VXX35084
Prep Method: SW5030B
Prep Date/Time: 10/13/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932004
Lab Project ID: 1195932

Collection Date: 10/01/19 14:45
Received Date: 10/03/19 12:14
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	0.226		0.0510	0.0153	ug/L	1		10/10/19 19:25
2-Methylnaphthalene	0.133		0.0510	0.0153	ug/L	1		10/10/19 19:25
Acenaphthene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Acenaphthylene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Anthracene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Benzo(a)Anthracene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Benzo[a]pyrene	0.0102	U	0.0204	0.00633	ug/L	1		10/10/19 19:25
Benzo[b]Fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Benzo[g,h,i]perylene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Benzo[k]fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Chrysene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Dibenzo[a,h]anthracene	0.0102	U	0.0204	0.00633	ug/L	1		10/10/19 19:25
Fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Fluorene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Indeno[1,2,3-c,d] pyrene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Naphthalene	0.280		0.102	0.0316	ug/L	1		10/10/19 19:25
Phenanthrene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Pyrene	0.0255	U	0.0510	0.0153	ug/L	1		10/10/19 19:25
Surrogates								
2-Methylnaphthalene-d10 (surr)	64.8		47-106		%	1		10/10/19 19:25
Fluoranthene-d10 (surr)	66.3		24-116		%	1		10/10/19 19:25

Batch Information

Analytical Batch: XMS11793
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 19:25
Container ID: 1195932004-C

Prep Batch: XXX42406
Prep Method: SW3520C
Prep Date/Time: 10/06/19 09:45
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932004
Lab Project ID: 1195932

Collection Date: 10/01/19 14:45
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.515	J	0.588	0.176	mg/L	1		10/15/19 06:00
Surrogates								
5a Androstane (surr)	95.3		50-150		%	1		10/15/19 06:00

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/15/19 06:00
Container ID: 1195932004-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.278	J	0.490	0.147	mg/L	1		10/15/19 06:00
Surrogates								
n-Triacontane-d62 (surr)	96.2		50-150		%	1		10/15/19 06:00

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/15/19 06:00
Container ID: 1195932004-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932004
Lab Project ID: 1195932

Collection Date: 10/01/19 14:45
Received Date: 10/03/19 12:14
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		10/08/19 20:34
Surrogates								
4-Bromofluorobenzene (surr)	84.7		50-150		%	1		10/08/19 20:34

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 20:34
Container ID: 1195932004-E

Prep Batch: VXX35048
Prep Method: SW5030B
Prep Date/Time: 10/08/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932004
Lab Project ID: 1195932

Collection Date: 10/01/19 14:45
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	1.50		1.00	0.310	ug/L	1		10/13/19 06:40
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		10/14/19 08:17
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		10/13/19 06:40
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
Benzene	0.200 U		0.400	0.120	ug/L	1		10/13/19 06:40
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		10/13/19 06:40
Naphthalene	0.968 J		1.00	0.310	ug/L	1		10/13/19 06:40
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
o-Xylene	0.416 J		1.00	0.310	ug/L	1		10/13/19 06:40
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		10/13/19 06:40
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
Toluene	0.500 U		1.00	0.310	ug/L	1		10/13/19 06:40
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		10/13/19 06:40
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		10/13/19 06:40
4-Bromofluorobenzene (surr)	102		85-114		%	1		10/13/19 06:40
Toluene-d8 (surr)	101		89-112		%	1		10/13/19 06:40

Batch Information

Analytical Batch: VMS19559
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/13/19 06:40
Container ID: 1195932004-H

Prep Batch: VXX35073
Prep Method: SW5030B
Prep Date/Time: 10/12/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19563
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/14/19 08:17
Container ID: 1195932004-F

Prep Batch: VXX35084
Prep Method: SW5030B
Prep Date/Time: 10/13/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932005
Lab Project ID: 1195932

Collection Date: 10/01/19 11:30
Received Date: 10/03/19 12:14
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	0.136		0.0472	0.0142	ug/L	1		10/10/19 19:45
2-Methylnaphthalene	0.0725		0.0472	0.0142	ug/L	1		10/10/19 19:45
Acenaphthene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Acenaphthylene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Anthracene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Benzo(a)Anthracene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Benzo[a]pyrene	0.00945	U	0.0189	0.00585	ug/L	1		10/10/19 19:45
Benzo[b]Fluoranthene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Benzo[g,h,i]perylene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Benzo[k]fluoranthene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Chrysene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Dibenzo[a,h]anthracene	0.00945	U	0.0189	0.00585	ug/L	1		10/10/19 19:45
Fluoranthene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Fluorene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Indeno[1,2,3-c,d] pyrene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Naphthalene	0.187		0.0943	0.0292	ug/L	1		10/10/19 19:45
Phenanthrene	0.0236	U	0.0472	0.0142	ug/L	1		10/10/19 19:45
Pyrene	0.0318	J	0.0472	0.0142	ug/L	1		10/10/19 19:45
Surrogates								
2-Methylnaphthalene-d10 (surr)	63.4		47-106		%	1		10/10/19 19:45
Fluoranthene-d10 (surr)	62.7		24-116		%	1		10/10/19 19:45

Batch Information

Analytical Batch: XMS11793
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 19:45
Container ID: 1195932005-C

Prep Batch: XXX42406
Prep Method: SW3520C
Prep Date/Time: 10/06/19 09:45
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932005
Lab Project ID: 1195932

Collection Date: 10/01/19 11:30
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.534	J	0.545	0.164	mg/L	1		10/15/19 06:10
Surrogates								
5a Androstane (surr)	107		50-150		%	1		10/15/19 06:10

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/15/19 06:10
Container ID: 1195932005-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 275 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.397	J	0.455	0.136	mg/L	1		10/15/19 06:10
Surrogates								
n-Triacontane-d62 (surr)	109		50-150		%	1		10/15/19 06:10

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/15/19 06:10
Container ID: 1195932005-A

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/08/19 08:20
Prep Initial Wt./Vol.: 275 mL
Prep Extract Vol: 1 mL

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932005
Lab Project ID: 1195932

Collection Date: 10/01/19 11:30
Received Date: 10/03/19 12:14
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		10/08/19 20:52
Surrogates								
4-Bromofluorobenzene (surr)	80.8		50-150		%	1		10/08/19 20:52

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 20:52
Container ID: 1195932005-E

Prep Batch: VXX35048
Prep Method: SW5030B
Prep Date/Time: 10/08/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932005
Lab Project ID: 1195932

Collection Date: 10/01/19 11:30
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.743	J	1.00	0.310	ug/L	1		10/13/19 06:55
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		10/14/19 08:33
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/13/19 06:55
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
Benzene	0.200	U	0.400	0.120	ug/L	1		10/13/19 06:55
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/13/19 06:55
Naphthalene	0.524	J	1.00	0.310	ug/L	1		10/13/19 06:55
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/13/19 06:55
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
Toluene	0.500	U	1.00	0.310	ug/L	1		10/13/19 06:55
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/13/19 06:55
Surrogates								
1,2-Dichloroethane-D4 (surr)	111		81-118		%	1		10/13/19 06:55
4-Bromofluorobenzene (surr)	99.7		85-114		%	1		10/13/19 06:55
Toluene-d8 (surr)	100		89-112		%	1		10/13/19 06:55

Batch Information

Analytical Batch: VMS19559
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/13/19 06:55
Container ID: 1195932005-H

Prep Batch: VXX35073
Prep Method: SW5030B
Prep Date/Time: 10/12/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19563
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/14/19 08:33
Container ID: 1195932005-F

Prep Batch: VXX35084
Prep Method: SW5030B
Prep Date/Time: 10/13/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-5**

Client Sample ID: **RSE-5**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932006
Lab Project ID: 1195932

Collection Date: 10/01/19 16:50
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):74.7
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
2-Methylnaphthalene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Acenaphthene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Acenaphthylene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Anthracene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Benzo(a)Anthracene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Benzo[a]pyrene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Benzo[b]Fluoranthene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Benzo[g,h,i]perylene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Benzo[k]fluoranthene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Chrysene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Dibenzo[a,h]anthracene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Fluoranthene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Fluorene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Indeno[1,2,3-c,d] pyrene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Naphthalene	13.4	U	26.8	6.69	ug/Kg	1		10/09/19 23:37
Phenanthrene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Pyrene	16.8	U	33.5	8.36	ug/Kg	1		10/09/19 23:37
Surrogates								
2-Methylnaphthalene-d10 (surr)	76.9		58-103		%	1		10/09/19 23:37
Fluoranthene-d10 (surr)	85.4		54-113		%	1		10/09/19 23:37

Batch Information

Analytical Batch: XMS11788
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 10/09/19 23:37
Container ID: 1195932006-A

Prep Batch: XXX42418
Prep Method: SW3550C
Prep Date/Time: 10/08/19 08:35
Prep Initial Wt./Vol.: 22.51 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-5**

Client Sample ID: **RSE-5**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932006
Lab Project ID: 1195932

Collection Date: 10/01/19 16:50
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):74.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	19.0	J	26.5	8.20	mg/Kg	1		10/10/19 14:57
Surrogates								
5a Androstane (surr)	72.6		50-150		%	1		10/10/19 14:57

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/10/19 14:57
Container ID: 1195932006-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.365 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	80.2		26.5	8.20	mg/Kg	1		10/10/19 14:57
Surrogates								
n-Triacontane-d62 (surr)	72.4		50-150		%	1		10/10/19 14:57

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/10/19 14:57
Container ID: 1195932006-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.365 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-5**

Client Sample ID: **RSE-5**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932006
Lab Project ID: 1195932

Collection Date: 10/01/19 16:50
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):74.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	3.12	U	6.24	1.87	mg/Kg	1		10/09/19 02:06
Surrogates								
4-Bromofluorobenzene (surr)	71		50-150		%	1		10/09/19 02:06

Batch Information

Analytical Batch: VFC14982
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/09/19 02:06
Container ID: 1195932006-B

Prep Batch: VXX35042
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:50
Prep Initial Wt./Vol.: 36.824 g
Prep Extract Vol: 34.3186 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-5**

Client Sample ID: **RSE-5**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932006
Lab Project ID: 1195932

Collection Date: 10/01/19 16:50
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):74.7
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	62.5	U	125	37.4	ug/Kg	1		10/05/19 17:44
1,2-Dibromoethane	1.25	U	2.50	0.774	ug/Kg	1		10/05/19 17:44
1,2-Dichloroethane	2.50	U	4.99	1.55	ug/Kg	1		10/05/19 17:44
1,3,5-Trimethylbenzene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
Benzene	15.6	U	31.2	9.73	ug/Kg	1		10/05/19 17:44
Ethylbenzene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
Isopropylbenzene (Cumene)	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
Methyl-t-butyl ether	125	U	250	77.4	ug/Kg	1		10/05/19 17:44
Naphthalene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
n-Butylbenzene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
o-Xylene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
P & M -Xylene	62.5	U	125	37.4	ug/Kg	1		10/05/19 17:44
sec-Butylbenzene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
tert-Butylbenzene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
Toluene	31.2	U	62.4	19.5	ug/Kg	1		10/05/19 17:44
Xylenes (total)	93.5	U	187	56.9	ug/Kg	1		10/05/19 17:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		71-136		%	1		10/05/19 17:44
4-Bromofluorobenzene (surr)	105		55-151		%	1		10/05/19 17:44
Toluene-d8 (surr)	99.2		85-116		%	1		10/05/19 17:44

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 10/05/19 17:44
Container ID: 1195932006-B

Prep Batch: VXX35036
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:50
Prep Initial Wt./Vol.: 36.824 g
Prep Extract Vol: 34.3186 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-6**

Client Sample ID: **RSE-6**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932007
Lab Project ID: 1195932

Collection Date: 10/01/19 16:35
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):78.2
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
2-Methylnaphthalene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Acenaphthene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Acenaphthylene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Anthracene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Benzo(a)Anthracene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Benzo[a]pyrene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Benzo[b]Fluoranthene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Benzo[g,h,i]perylene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Benzo[k]fluoranthene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Chrysene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Dibenzo[a,h]anthracene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Fluoranthene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Fluorene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Indeno[1,2,3-c,d] pyrene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Naphthalene	12.8	U	25.6	6.39	ug/Kg	1		10/09/19 23:58
Phenanthrene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Pyrene	15.9	U	31.9	7.99	ug/Kg	1		10/09/19 23:58
Surrogates								
2-Methylnaphthalene-d10 (surr)	82.9		58-103		%	1		10/09/19 23:58
Fluoranthene-d10 (surr)	73		54-113		%	1		10/09/19 23:58

Batch Information

Analytical Batch: XMS11788
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 10/09/19 23:58
Container ID: 1195932007-A

Prep Batch: XXX42418
Prep Method: SW3550C
Prep Date/Time: 10/08/19 08:35
Prep Initial Wt./Vol.: 22.527 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-6**

Client Sample ID: **RSE-6**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932007
Lab Project ID: 1195932

Collection Date: 10/01/19 16:35
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):78.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	391		25.3	7.84	mg/Kg	1		10/10/19 15:07
Surrogates								
5a Androstane (surr)	89.5		50-150		%	1		10/10/19 15:07

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/10/19 15:07
Container ID: 1195932007-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.338 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	80.2		25.3	7.84	mg/Kg	1		10/10/19 15:07
Surrogates								
n-Triacontane-d62 (surr)	88.9		50-150		%	1		10/10/19 15:07

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/10/19 15:07
Container ID: 1195932007-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.338 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-6**

Client Sample ID: **RSE-6**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932007
Lab Project ID: 1195932

Collection Date: 10/01/19 16:35
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):78.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	3.40	U	6.80	2.04	mg/Kg	1		10/09/19 02:24
Surrogates								
4-Bromofluorobenzene (surr)	71.9		50-150		%	1		10/09/19 02:24

Batch Information

Analytical Batch: VFC14982
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/09/19 02:24
Container ID: 1195932007-B

Prep Batch: VXX35042
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:35
Prep Initial Wt./Vol.: 29.594 g
Prep Extract Vol: 31.4652 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-6**

Client Sample ID: **RSE-6**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932007
Lab Project ID: 1195932

Collection Date: 10/01/19 16:35
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):78.2
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	68.0	U	136	40.8	ug/Kg	1		10/05/19 18:00
1,2-Dibromoethane	1.36	U	2.72	0.843	ug/Kg	1		10/05/19 18:00
1,2-Dichloroethane	2.72	U	5.44	1.69	ug/Kg	1		10/05/19 18:00
1,3,5-Trimethylbenzene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
Benzene	17.0	U	34.0	10.6	ug/Kg	1		10/05/19 18:00
Ethylbenzene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
Isopropylbenzene (Cumene)	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
Methyl-t-butyl ether	136	U	272	84.3	ug/Kg	1		10/05/19 18:00
Naphthalene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
n-Butylbenzene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
o-Xylene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
P & M -Xylene	68.0	U	136	40.8	ug/Kg	1		10/05/19 18:00
sec-Butylbenzene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
tert-Butylbenzene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
Toluene	34.0	U	68.0	21.2	ug/Kg	1		10/05/19 18:00
Xylenes (total)	102	U	204	62.0	ug/Kg	1		10/05/19 18:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		71-136		%	1		10/05/19 18:00
4-Bromofluorobenzene (surr)	99.4		55-151		%	1		10/05/19 18:00
Toluene-d8 (surr)	97.8		85-116		%	1		10/05/19 18:00

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 10/05/19 18:00
Container ID: 1195932007-B

Prep Batch: VXX35036
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:35
Prep Initial Wt./Vol.: 29.594 g
Prep Extract Vol: 31.4652 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-7**

Client Sample ID: **RSE-7**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932008
Lab Project ID: 1195932

Collection Date: 10/01/19 16:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):91.5
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	2540		273	68.1	ug/Kg	10		10/10/19 20:54
2-Methylnaphthalene	2940		273	68.1	ug/Kg	10		10/10/19 20:54
Acenaphthene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Acenaphthylene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Anthracene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Benzo(a)Anthracene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Benzo[a]pyrene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Benzo[b]Fluoranthene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Benzo[g,h,i]perylene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Benzo[k]fluoranthene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Chrysene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Dibenzo[a,h]anthracene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Fluoranthene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Fluorene	271		27.3	6.81	ug/Kg	1		10/10/19 00:18
Indeno[1,2,3-c,d] pyrene	13.7 U		27.3	6.81	ug/Kg	1		10/10/19 00:18
Naphthalene	693		218	54.5	ug/Kg	10		10/10/19 20:54
Phenanthrene	309		27.3	6.81	ug/Kg	1		10/10/19 00:18
Pyrene	20.2 J		27.3	6.81	ug/Kg	1		10/10/19 00:18
Surrogates								
2-Methylnaphthalene-d10 (surr)	60.5		58-103		%	1		10/10/19 00:18
Fluoranthene-d10 (surr)	79.6		54-113		%	1		10/10/19 00:18

Batch Information

Analytical Batch: XMS11788
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 00:18
Container ID: 1195932008-A

Prep Batch: XXX42418
Prep Method: SW3550C
Prep Date/Time: 10/08/19 08:35
Prep Initial Wt./Vol.: 22.548 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11790
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 20:54
Container ID: 1195932008-A

Prep Batch: XXX42418
Prep Method: SW3550C
Prep Date/Time: 10/08/19 08:35
Prep Initial Wt./Vol.: 22.548 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-7**

Client Sample ID: **RSE-7**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932008
Lab Project ID: 1195932

Collection Date: 10/01/19 16:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):91.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2610		21.8	6.75	mg/Kg	1		10/10/19 15:17
Surrogates								
5a Androstane (surr)	96.5		50-150		%	1		10/10/19 15:17

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/10/19 15:17
Container ID: 1195932008-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.093 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	108		21.8	6.75	mg/Kg	1		10/10/19 15:17
Surrogates								
n-Triacontane-d62 (surr)	91.2		50-150		%	1		10/10/19 15:17

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/10/19 15:17
Container ID: 1195932008-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.093 g
Prep Extract Vol: 5 mL

Results of **RSE-7**

Client Sample ID: **RSE-7**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932008
Lab Project ID: 1195932

Collection Date: 10/01/19 16:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):91.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	140		51.2	15.4	mg/Kg	10		10/09/19 02:42
Surrogates								
4-Bromofluorobenzene (surr)	587	*	50-150		%	10		10/09/19 02:42

Batch Information

Analytical Batch: VFC14982
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/09/19 02:42
Container ID: 1195932008-B

Prep Batch: VXX35042
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:00
Prep Initial Wt./Vol.: 29.301 g
Prep Extract Vol: 27.4777 mL

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

Results of **RSE-7**

Client Sample ID: **RSE-7**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932008
Lab Project ID: 1195932

Collection Date: 10/01/19 16:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):91.5
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	3670		1020	307	ug/Kg	10		10/05/19 18:49
1,2-Dibromoethane	10.3 U		20.5	6.35	ug/Kg	10		10/05/19 18:49
1,2-Dichloroethane	20.5 U		41.0	12.7	ug/Kg	10		10/05/19 18:49
1,3,5-Trimethylbenzene	1870		512	160	ug/Kg	10		10/05/19 18:49
Benzene	128 U		256	79.9	ug/Kg	10		10/05/19 18:49
Ethylbenzene	256 U		512	160	ug/Kg	10		10/05/19 18:49
Isopropylbenzene (Cumene)	225 J		512	160	ug/Kg	10		10/05/19 18:49
Methyl-t-butyl ether	1025 U		2050	635	ug/Kg	10		10/05/19 18:49
Naphthalene	948		512	160	ug/Kg	10		10/05/19 18:49
n-Butylbenzene	256 U		512	160	ug/Kg	10		10/05/19 18:49
o-Xylene	256 U		512	160	ug/Kg	10		10/05/19 18:49
P & M -Xylene	510 U		1020	307	ug/Kg	10		10/05/19 18:49
sec-Butylbenzene	814		512	160	ug/Kg	10		10/05/19 18:49
tert-Butylbenzene	256 U		512	160	ug/Kg	10		10/05/19 18:49
Toluene	256 U		512	160	ug/Kg	10		10/05/19 18:49
Xylenes (total)	770 U		1540	467	ug/Kg	10		10/05/19 18:49
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		71-136		%	10		10/05/19 18:49
4-Bromofluorobenzene (surr)	139		55-151		%	10		10/05/19 18:49
Toluene-d8 (surr)	99.4		85-116		%	10		10/05/19 18:49

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 10/05/19 18:49
Container ID: 1195932008-B

Prep Batch: VXX35036
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:00
Prep Initial Wt./Vol.: 29.301 g
Prep Extract Vol: 27.4777 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932009
Lab Project ID: 1195932

Collection Date: 10/01/19 18:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):93.1
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	357		26.7	6.68	ug/Kg	1		10/10/19 00:39
2-Methylnaphthalene	391		26.7	6.68	ug/Kg	1		10/10/19 00:39
Acenaphthene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Acenaphthylene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Anthracene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Benzo(a)Anthracene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Benzo[a]pyrene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Benzo[b]Fluoranthene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Benzo[g,h,i]perylene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Benzo[k]fluoranthene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Chrysene	14.0 J		26.7	6.68	ug/Kg	1		10/10/19 00:39
Dibenzo[a,h]anthracene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Fluoranthene	14.2 J		26.7	6.68	ug/Kg	1		10/10/19 00:39
Fluorene	48.2		26.7	6.68	ug/Kg	1		10/10/19 00:39
Indeno[1,2,3-c,d] pyrene	13.4 U		26.7	6.68	ug/Kg	1		10/10/19 00:39
Naphthalene	103		21.4	5.34	ug/Kg	1		10/10/19 00:39
Phenanthrene	62.4		26.7	6.68	ug/Kg	1		10/10/19 00:39
Pyrene	13.8 J		26.7	6.68	ug/Kg	1		10/10/19 00:39
Surrogates								
2-Methylnaphthalene-d10 (surr)	92.9		58-103		%	1		10/10/19 00:39
Fluoranthene-d10 (surr)	76.7		54-113		%	1		10/10/19 00:39

Batch Information

Analytical Batch: XMS11788
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 10/10/19 00:39
Container ID: 1195932009-A

Prep Batch: XXX42418
Prep Method: SW3550C
Prep Date/Time: 10/08/19 08:35
Prep Initial Wt./Vol.: 22.618 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932009
Lab Project ID: 1195932

Collection Date: 10/01/19 18:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):93.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	375		21.4	6.63	mg/Kg	1		10/10/19 15:27
Surrogates								
5a Androstane (surr)	95.5		50-150		%	1		10/10/19 15:27

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 10/10/19 15:27
Container ID: 1195932009-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.125 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	145		21.4	6.63	mg/Kg	1		10/10/19 15:27
Surrogates								
n-Triacontane-d62 (surr)	94.1		50-150		%	1		10/10/19 15:27

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 10/10/19 15:27
Container ID: 1195932009-A

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/08/19 10:12
Prep Initial Wt./Vol.: 30.125 g
Prep Extract Vol: 5 mL

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932009
Lab Project ID: 1195932

Collection Date: 10/01/19 18:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):93.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	73.8		42.0	12.6	mg/Kg	10		10/09/19 02:59
Surrogates								
4-Bromofluorobenzene (surr)	388	*	50-150		%	10		10/09/19 02:59

Batch Information

Analytical Batch: VFC14982
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/09/19 02:59
Container ID: 1195932009-B

Prep Batch: VXX35042
Prep Method: SW5035A
Prep Date/Time: 10/01/19 18:00
Prep Initial Wt./Vol.: 35.085 g
Prep Extract Vol: 27.4194 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932009
Lab Project ID: 1195932

Collection Date: 10/01/19 18:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):93.1
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	1750		839	252	ug/Kg	10		10/05/19 19:06
1,2-Dibromoethane	8.40 U		16.8	5.20	ug/Kg	10		10/05/19 19:06
1,2-Dichloroethane	16.8 U		33.6	10.4	ug/Kg	10		10/05/19 19:06
1,3,5-Trimethylbenzene	886		420	131	ug/Kg	10		10/05/19 19:06
Benzene	105 U		210	65.5	ug/Kg	10		10/05/19 19:06
Ethylbenzene	210 U		420	131	ug/Kg	10		10/05/19 19:06
Isopropylbenzene (Cumene)	210 U		420	131	ug/Kg	10		10/05/19 19:06
Methyl-t-butyl ether	840 U		1680	520	ug/Kg	10		10/05/19 19:06
Naphthalene	546		420	131	ug/Kg	10		10/05/19 19:06
n-Butylbenzene	210 U		420	131	ug/Kg	10		10/05/19 19:06
o-Xylene	210 U		420	131	ug/Kg	10		10/05/19 19:06
P & M -Xylene	420 U		839	252	ug/Kg	10		10/05/19 19:06
sec-Butylbenzene	424		420	131	ug/Kg	10		10/05/19 19:06
tert-Butylbenzene	210 U		420	131	ug/Kg	10		10/05/19 19:06
Toluene	210 U		420	131	ug/Kg	10		10/05/19 19:06
Xylenes (total)	630 U		1260	383	ug/Kg	10		10/05/19 19:06
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		71-136		%	10		10/05/19 19:06
4-Bromofluorobenzene (surr)	121		55-151		%	10		10/05/19 19:06
Toluene-d8 (surr)	99.2		85-116		%	10		10/05/19 19:06

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 10/05/19 19:06
Container ID: 1195932009-B

Prep Batch: VXX35036
Prep Method: SW5035A
Prep Date/Time: 10/01/19 18:00
Prep Initial Wt./Vol.: 35.085 g
Prep Extract Vol: 27.4194 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932010
Lab Project ID: 1195932

Collection Date: 10/01/19 16:00
Received Date: 10/03/19 12:14
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	1.25	U	2.50	0.751	mg/Kg	1		10/08/19 23:10
Surrogates								
4-Bromofluorobenzene (surr)	76.2		50-150		%	1		10/08/19 23:10

Batch Information

Analytical Batch: VFC14982
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 23:10
Container ID: 1195932010-A

Prep Batch: VXX35042
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:00
Prep Initial Wt./Vol.: 49.917 g
Prep Extract Vol: 25 mL

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932010
Lab Project ID: 1195932

Collection Date: 10/01/19 16:00
Received Date: 10/03/19 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	25.1 U		50.1	15.0	ug/Kg	1		10/05/19 13:55
1,2-Dibromoethane	0.500 U		1.00	0.311	ug/Kg	1		10/05/19 13:55
1,2-Dichloroethane	1.00 U		2.00	0.621	ug/Kg	1		10/05/19 13:55
1,3,5-Trimethylbenzene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
Benzene	6.25 U		12.5	3.91	ug/Kg	1		10/05/19 13:55
Ethylbenzene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
Isopropylbenzene (Cumene)	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
Methyl-t-butyl ether	50.0 U		100	31.1	ug/Kg	1		10/05/19 13:55
Naphthalene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
n-Butylbenzene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
o-Xylene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
P & M -Xylene	25.1 U		50.1	15.0	ug/Kg	1		10/05/19 13:55
sec-Butylbenzene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
tert-Butylbenzene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
Toluene	12.5 U		25.0	7.81	ug/Kg	1		10/05/19 13:55
Xylenes (total)	37.5 U		75.1	22.8	ug/Kg	1		10/05/19 13:55
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		71-136		%	1		10/05/19 13:55
4-Bromofluorobenzene (surr)	100		55-151		%	1		10/05/19 13:55
Toluene-d8 (surr)	98.7		85-116		%	1		10/05/19 13:55

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Analyst: KAJ
Analytical Date/Time: 10/05/19 13:55
Container ID: 1195932010-A

Prep Batch: VXX35036
Prep Method: SW5035A
Prep Date/Time: 10/01/19 16:00
Prep Initial Wt./Vol.: 49.917 g
Prep Extract Vol: 25 mL

Print Date: 10/16/2019 4:18:49PM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932011
Lab Project ID: 1195932

Collection Date: 10/01/19 11:30
Received Date: 10/03/19 12:14
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		10/08/19 05:39
Surrogates								
4-Bromofluorobenzene (surr)	81.4		50-150		%	1		10/08/19 05:39

Batch Information

Analytical Batch: VFC14981
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/19 05:39
Container ID: 1195932011-A

Prep Batch: VXX35035
Prep Method: SW5030B
Prep Date/Time: 10/07/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **19-2038 - ARRC Hurricane**
Lab Sample ID: 1195932011
Lab Project ID: 1195932

Collection Date: 10/01/19 11:30
Received Date: 10/03/19 12:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		10/14/19 07:47
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		10/13/19 04:35
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
Benzene	0.200	U	0.400	0.120	ug/L	1		10/13/19 04:35
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		10/13/19 04:35
Naphthalene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
o-Xylene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		10/13/19 04:35
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
Toluene	0.500	U	1.00	0.310	ug/L	1		10/13/19 04:35
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		10/13/19 04:35
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		10/13/19 04:35
4-Bromofluorobenzene (surr)	104		85-114		%	1		10/13/19 04:35
Toluene-d8 (surr)	101		89-112		%	1		10/13/19 04:35

Batch Information

Analytical Batch: VMS19559
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/13/19 04:35
Container ID: 1195932011-D

Prep Batch: VXX35073
Prep Method: SW5030B
Prep Date/Time: 10/12/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19563
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 10/14/19 07:47
Container ID: 1195932011-B

Prep Batch: VXX35084
Prep Method: SW5030B
Prep Date/Time: 10/13/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1800519 [SPT/10903]
Blank Lab ID: 1536908

Matrix: Soil/Solid (dry weight)

QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10903
Analytical Method: SM21 2540G
Instrument:
Analyst: MER
Analytical Date/Time: 10/7/2019 5:42:00PM

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Duplicate Sample Summary

Original Sample ID: 1195932009
Duplicate Sample ID: 1536909
QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009

Analysis Date: 10/07/2019 17:42
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.1	93.6	%	0.58	(< 15)

Batch Information

Analytical Batch: SPT10903
Analytical Method: SM21 2540G
Instrument:
Analyst: MER

Print Date: 10/16/2019 4:18:53PM

Method Blank

Blank ID: MB for HBN 1800541 [VXX/35035]
Blank Lab ID: 1537071

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932011

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	78.6	50-150		%

Batch Information

Analytical Batch: VFC14981
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2019 3:36:00AM

Prep Batch: VXX35035
Prep Method: SW5030B
Prep Date/Time: 10/7/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35035]
Blank Spike Lab ID: 1537074
Date Analyzed: 10/08/2019 04:29

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35035]
Spike Duplicate Lab ID: 1537075
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932011

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	0.991	99	1.00	0.993	99	(60-120)	0.22	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	86.2	86	0.0500	83.9	84	(50-150)	2.70	

Batch Information

Analytical Batch: **VFC14981**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35035**
Prep Method: **SW5030B**
Prep Date/Time: **10/07/2019 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 1800545 [VXX/35036]
Blank Lab ID: 1537088

Matrix: Soil/Solid (dry weight)

QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009, 1195932010

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromoethane	0.500U	1.00	0.310	ug/Kg
1,2-Dichloroethane	1.00U	2.00	0.620	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
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
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	106	71-136		%
4-Bromofluorobenzene (surr)	95.9	55-151		%
Toluene-d8 (surr)	97.5	85-116		%

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 10/5/2019 11:09:00AM

Prep Batch: VXX35036
Prep Method: SW5035A
Prep Date/Time: 10/5/2019 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35036]
Blank Spike Lab ID: 1537089
Date Analyzed: 10/05/2019 11:25

Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009, 1195932010

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	697	93	(75-123)
1,2-Dibromoethane	750	731	98	(78-122)
1,2-Dichloroethane	750	706	94	(73-128)
1,3,5-Trimethylbenzene	750	725	97	(73-124)
Benzene	750	728	97	(77-121)
Ethylbenzene	750	676	90	(76-122)
Isopropylbenzene (Cumene)	750	736	98	(68-134)
Methyl-t-butyl ether	1130	1090	97	(73-125)
Naphthalene	750	721	96	(62-129)
n-Butylbenzene	750	847	113	(70-128)
o-Xylene	750	648	86	(77-123)
P & M -Xylene	1500	1300	86	(77-124)
sec-Butylbenzene	750	776	104	(73-126)
tert-Butylbenzene	750	741	99	(73-125)
Toluene	750	645	86	(77-121)
Xylenes (total)	2250	1940	86	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	95.6	96	(71-136)
4-Bromofluorobenzene (surr)	750	97.8	98	(55-151)
Toluene-d8 (surr)	750	99.4	99	(85-116)

Batch Information

Analytical Batch: **VMS19535**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **KAJ**

Prep Batch: **VXX35036**
Prep Method: **SW5035A**
Prep Date/Time: **10/05/2019 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/16/2019 4:19:01PM

Matrix Spike Summary

Original Sample ID: 1195816003
MS Sample ID: 1537090 MS
MSD Sample ID: 1537091 MSD

Analysis Date: 10/05/2019 14:11
Analysis Date: 10/05/2019 12:33
Analysis Date: 10/05/2019 12:49
Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009, 1195932010

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	30.8U	820	697	85	820	714	87	75-123	2.50	(< 20)
1,3,5-Trimethylbenzene	15.4U	820	725	88	820	757	92	73-124	4.30	(< 20)
Ethylbenzene	15.4U	820	702	85	820	737	90	76-122	5.00	(< 20)
o-Xylene	15.4U	820	675	82	820	707	86	77-123	4.60	(< 20)
P & M -Xylene	30.8U	1636	1358	83	1636	1412	86	77-124	3.60	(< 20)
Toluene	15.4U	820	661	81	820	692	84	77-121	4.60	(< 20)
Xylenes (total)	46.2U	2460	2032	83	2460	2118	86	78-124	4.00	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		820	803	98	820	787	96	71-136	2.00	
4-Bromofluorobenzene (surr)		1369	1166	85	1369	1166	86	55-151	0.47	
Toluene-d8 (surr)		820	824	100	820	817	100	85-116	0.67	

Batch Information

Analytical Batch: VMS19535
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: KAJ
Analytical Date/Time: 10/5/2019 12:33:00PM

Prep Batch: VXX35036
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/5/2019 6:00:00AM
Prep Initial Wt./Vol.: 48.86g
Prep Extract Vol: 25.00mL

Print Date: 10/16/2019 4:19:02PM

Method Blank

Blank ID: MB for HBN 1800626 [VXX/35042]
Blank Lab ID: 1537274

Matrix: Soil/Solid (dry weight)

QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009, 1195932010

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	73.2	50-150		%

Batch Information

Analytical Batch: VFC14982
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2019 10:52:00PM

Prep Batch: VXX35042
Prep Method: SW5035A
Prep Date/Time: 10/8/2019 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 1195932 [VXX35042]
Blank Spike Lab ID: 1537275
Date Analyzed: 10/08/2019 22:17

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35042]
Spike Duplicate Lab ID: 1537276
Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009, 1195932010

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	12.9	103	12.5	13.2	105	(60-120)	1.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	77.9	78	1.25	85.3	85	(50-150)	9.10	

Batch Information

Analytical Batch: **VFC14982**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX35042**
Prep Method: **SW5035A**
Prep Date/Time: **10/08/2019 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 1800656 [VXX/35047]
Blank Lab ID: 1537358

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932001, 1195932002, 1195932003

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	84.7	50-150		%

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2019 12:36:00PM

Prep Batch: VXX35047
Prep Method: SW5030B
Prep Date/Time: 10/8/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35047]
Blank Spike Lab ID: 1537361
Date Analyzed: 10/08/2019 13:29

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35047]
Spike Duplicate Lab ID: 1537362
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932001, 1195932002, 1195932003

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	1.03	103	1.00	1.08	108	(60-120)	4.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	87.4	87	0.0500	185	185	* (50-150)	71.60	

Batch Information

Analytical Batch: **VFC14983**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35047**
Prep Method: **SW5030B**
Prep Date/Time: **10/08/2019 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 1800658 [VXX/35048]
Blank Lab ID: 1537363

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932004, 1195932005

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	85.1	50-150		%

Batch Information

Analytical Batch: VFC14983
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2019 7:59:00PM

Prep Batch: VXX35048
Prep Method: SW5030B
Prep Date/Time: 10/8/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35048]
Blank Spike Lab ID: 1537366
Date Analyzed: 10/09/2019 01:53

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35048]
Spike Duplicate Lab ID: 1537367
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932004, 1195932005

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	0.975	98	1.00	1.05	105	(60-120)	7.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	87.5	88	0.0500	90.3	90	(50-150)	3.20	

Batch Information

Analytical Batch: **VFC14983**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX35048**
Prep Method: **SW5030B**
Prep Date/Time: **10/08/2019 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 1800857 [VXX/35070]
Blank Lab ID: 1538091

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932001, 1195932002

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
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
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	113	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	100	89-112		%

Batch Information

Analytical Batch: VMS19556
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: CMC
Analytical Date/Time: 10/11/2019 9:40:00PM

Prep Batch: VXX35070
Prep Method: SW5030B
Prep Date/Time: 10/11/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35070]
Blank Spike Lab ID: 1538092
Date Analyzed: 10/11/2019 22:09

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35070]
Spike Duplicate Lab ID: 1538093
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932001, 1195932002

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	30	31.0	103	30	30.6	102	(79-124)	1.20	(< 20)
1,2-Dichloroethane	30	28.1	94	30	28.0	93	(73-128)	0.39	(< 20)
1,3,5-Trimethylbenzene	30	30.8	103	30	30.8	103	(75-124)	0.11	(< 20)
Benzene	30	29.4	98	30	29.1	97	(79-120)	1.10	(< 20)
Ethylbenzene	30	30.4	101	30	30.4	101	(79-121)	0.17	(< 20)
Isopropylbenzene (Cumene)	30	30.9	103	30	30.6	102	(72-131)	0.81	(< 20)
Methyl-t-butyl ether	45	45.4	101	45	45.8	102	(71-124)	0.96	(< 20)
Naphthalene	30	32.7	109	30	33.2	111	(61-128)	1.60	(< 20)
n-Butylbenzene	30	31.1	104	30	30.5	102	(75-128)	1.90	(< 20)
o-Xylene	30	30.6	102	30	30.5	102	(78-122)	0.44	(< 20)
P & M -Xylene	60	61.0	102	60	60.5	101	(80-121)	0.92	(< 20)
sec-Butylbenzene	30	30.2	101	30	29.8	100	(77-126)	1.10	(< 20)
tert-Butylbenzene	30	30.5	102	30	29.7	99	(78-124)	2.40	(< 20)
Toluene	30	29.6	99	30	29.5	98	(80-121)	0.37	(< 20)
Xylenes (total)	90	91.7	102	90	91.0	101	(79-121)	0.76	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98	98	30	96.8	97	(81-118)	1.30	
4-Bromofluorobenzene (surr)	30	97.2	97	30	97.2	97	(85-114)	0.03	
Toluene-d8 (surr)	30	103	103	30	104	104	(89-112)	0.89	

Batch Information

Analytical Batch: **VMS19556**
Analytical Method: **SW8260C**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **CMC**

Prep Batch: **VXX35070**
Prep Method: **SW5030B**
Prep Date/Time: **10/11/2019 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 10/16/2019 4:19:15PM

Method Blank

Blank ID: MB for HBN 1800864 [VXX/35073]
Blank Lab ID: 1538114

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932003, 1195932004, 1195932005, 1195932011

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
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
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	117	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	107	89-112		%

Batch Information

Analytical Batch: VMS19559
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 10/13/2019 2:45:00AM

Prep Batch: VXX35073
Prep Method: SW5030B
Prep Date/Time: 10/12/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35073]
Blank Spike Lab ID: 1538115
Date Analyzed: 10/13/2019 03:01

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35073]
Spike Duplicate Lab ID: 1538116
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932003, 1195932004, 1195932005, 1195932011

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	30	30.6	102	30	31.5	105	(79-124)	2.80	(< 20)
1,2-Dichloroethane	30	26.9	90	30	29.8	100	(73-128)	10.20	(< 20)
1,3,5-Trimethylbenzene	30	30.3	101	30	31.4	105	(75-124)	3.60	(< 20)
Benzene	30	30.0	100	30	29.5	98	(79-120)	1.80	(< 20)
Ethylbenzene	30	31.0	103	30	29.0	97	(79-121)	6.70	(< 20)
Isopropylbenzene (Cumene)	30	31.5	105	30	28.5	95	(72-131)	10.10	(< 20)
Methyl-t-butyl ether	45	45.4	101	45	58.5	130	* (71-124)	25.30	* (< 20)
Naphthalene	30	31.5	105	30	33.2	111	(61-128)	5.40	(< 20)
n-Butylbenzene	30	31.6	105	30	31.2	104	(75-128)	1.20	(< 20)
o-Xylene	30	31.5	105	30	28.8	96	(78-122)	8.80	(< 20)
P & M -Xylene	60	62.1	104	60	58.0	97	(80-121)	6.90	(< 20)
sec-Butylbenzene	30	30.5	102	30	30.6	102	(77-126)	0.37	(< 20)
tert-Butylbenzene	30	30.6	102	30	30.9	103	(78-124)	1.10	(< 20)
Toluene	30	29.5	98	30	29.5	98	(80-121)	0.03	(< 20)
Xylenes (total)	90	93.6	104	90	86.8	97	(79-121)	7.50	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	91.9	92	30	105	105	(81-118)	13.30	
4-Bromofluorobenzene (surr)	30	94.8	95	30	98.6	99	(85-114)	3.90	
Toluene-d8 (surr)	30	101	101	30	103	103	(89-112)	1.50	

Batch Information

Analytical Batch: **VMS19559**
Analytical Method: **SW8260C**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **NRB**

Prep Batch: **VXX35073**
Prep Method: **SW5030B**
Prep Date/Time: **10/12/2019 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 10/16/2019 4:19:18PM

Method Blank

Blank ID: MB for HBN 1800921 [VXX/35084]
Blank Lab ID: 1538367

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932003, 1195932004, 1195932005, 1195932011

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	99.6	81-118		%
4-Bromofluorobenzene (surr)	96.6	85-114		%
Toluene-d8 (surr)	100	89-112		%

Batch Information

Analytical Batch: VMS19563
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 10/14/2019 4:44:00AM

Prep Batch: VXX35084
Prep Method: SW5030B
Prep Date/Time: 10/13/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35084]
Blank Spike Lab ID: 1538368
Date Analyzed: 10/14/2019 04:59

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35084]
Spike Duplicate Lab ID: 1538369
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932003, 1195932004, 1195932005, 1195932011

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dibromoethane	30	32.3	108	30	31.9	106	(77-121)	1.30	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	99.7	100	30	99.1	99	(81-118)	0.61	
4-Bromofluorobenzene (surr)	30	96.1	96	30	97	97	(85-114)	0.93	
Toluene-d8 (surr)	30	99.9	100	30	101	101	(89-112)	1.30	

Batch Information

Analytical Batch: **VMS19563**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX35084**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2019 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1801002 [VXX/35092]
Blank Lab ID: 1538557

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932001, 1195932002

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	100	81-118		%
4-Bromofluorobenzene (surr)	96.6	85-114		%
Toluene-d8 (surr)	100	89-112		%

Batch Information

Analytical Batch: VMS19567
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: CMC
Analytical Date/Time: 10/14/2019 12:54:00PM

Prep Batch: VXX35092
Prep Method: SW5030B
Prep Date/Time: 10/14/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [VXX35092]
Blank Spike Lab ID: 1538558
Date Analyzed: 10/14/2019 13:09

Spike Duplicate ID: LCSD for HBN 1195932 [VXX35092]
Spike Duplicate Lab ID: 1538559
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932001, 1195932002

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dibromoethane	30	31.0	103	30	32.2	107	(77-121)	4.10	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	99.8	100	30	99.8	100	(81-118)	0.00	
4-Bromofluorobenzene (surr)	30	98.1	98	30	96.2	96	(85-114)	2.00	
Toluene-d8 (surr)	30	99.7	100	30	101	101	(89-112)	1.20	

Batch Information

Analytical Batch: **VMS19567**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **CMC**

Prep Batch: **VXX35092**
Prep Method: **SW5030B**
Prep Date/Time: **10/14/2019 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1800450 [XXX/42406]
Blank Lab ID: 1536504

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932001, 1195932002, 1195932003, 1195932004, 1195932005

Results by **8270D SIM 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	0.0100U	0.0200	0.00620	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	0.0100U	0.0200	0.00620	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-Methylnaphthalene-d10 (surr)	55.1	47-106		%
Fluoranthene-d10 (surr)	61.4	24-116		%

Batch Information

Analytical Batch: XMS11793
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 10/10/2019 5:22:00PM

Prep Batch: XXX42406
Prep Method: SW3520C
Prep Date/Time: 10/6/2019 9:45:29AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [XXX42406]
Blank Spike Lab ID: 1536505
Date Analyzed: 10/10/2019 17:42

Spike Duplicate ID: LCSD for HBN 1195932 [XXX42406]
Spike Duplicate Lab ID: 1536506
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932001, 1195932002, 1195932003, 1195932004, 1195932005

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

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.42	71	2	1.24	62	(41-115)	13.50	(< 20)
2-Methylnaphthalene	2	1.35	68	2	1.23	61	(39-114)	9.80	(< 20)
Acenaphthene	2	1.46	73	2	1.33	66	(48-114)	9.30	(< 20)
Acenaphthylene	2	1.57	79	2	1.39	70	(35-121)	11.80	(< 20)
Anthracene	2	1.63	82	2	1.49	75	(53-119)	9.20	(< 20)
Benzo(a)Anthracene	2	1.56	78	2	1.40	70	(59-120)	10.70	(< 20)
Benzo[a]pyrene	2	1.50	75	2	1.33	66	(53-120)	12.60	(< 20)
Benzo[b]Fluoranthene	2	1.55	77	2	1.39	70	(53-126)	10.50	(< 20)
Benzo[g,h,i]perylene	2	1.44	72	2	1.27	64	(44-128)	12.60	(< 20)
Benzo[k]fluoranthene	2	1.60	80	2	1.44	72	(54-125)	10.20	(< 20)
Chrysene	2	1.60	80	2	1.42	71	(57-120)	11.80	(< 20)
Dibenzo[a,h]anthracene	2	1.37	69	2	1.18	59	(44-131)	15.00	(< 20)
Fluoranthene	2	1.55	78	2	1.37	68	(58-120)	12.50	(< 20)
Fluorene	2	1.60	80	2	1.44	72	(50-118)	10.70	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.55	78	2	1.37	68	(48-130)	12.50	(< 20)
Naphthalene	2	1.29	65	2	1.15	58	(43-114)	11.70	(< 20)
Phenanthrene	2	1.63	81	2	1.44	72	(53-115)	12.20	(< 20)
Pyrene	2	1.63	82	2	1.43	72	(53-121)	13.00	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	69.1	69	2	63.3	63	(47-106)	8.80	
Fluoranthene-d10 (surr)	2	79	79	2	69.9	70	(24-116)	12.30	

Batch Information

Analytical Batch: **XMS11793**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **DSD**

Prep Batch: **XXX42406**
Prep Method: **SW3520C**
Prep Date/Time: **10/06/2019 09:45**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Print Date: 10/16/2019 4:19:26PM

Method Blank

Blank ID: MB for HBN 1800515 [XXX/42415]
Blank Lab ID: 1536893

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932001, 1195932002, 1195932003, 1195932004, 1195932005

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.225J	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	96.1	60-120		%

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CMS
Analytical Date/Time: 10/14/2019 9:57:00PM

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/8/2019 8:20:17AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [XXX42415]
Blank Spike Lab ID: 1536894
Date Analyzed: 10/14/2019 22:36

Spike Duplicate ID: LCSD for HBN 1195932 [XXX42415]
Spike Duplicate Lab ID: 1536895
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932001, 1195932002, 1195932003, 1195932004, 1195932005

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	19.4	97	20	19.2	96	(75-125)	1.00	(< 20)
Surrogates									
5a Androstane (surr)	0.4	111	111	0.4	111	111	(60-120)	0.73	

Batch Information

Analytical Batch: **XFC15404**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CMS**

Prep Batch: **XXX42415**
Prep Method: **SW3520C**
Prep Date/Time: **10/08/2019 08:20**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1800515 [XXX/42415]
Blank Lab ID: 1536893

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195932001, 1195932002, 1195932003, 1195932004, 1195932005

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	99.6	60-120		%

Batch Information

Analytical Batch: XFC15404
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: CMS
Analytical Date/Time: 10/14/2019 9:57:00PM

Prep Batch: XXX42415
Prep Method: SW3520C
Prep Date/Time: 10/8/2019 8:20:17AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [XXX42415]
Blank Spike Lab ID: 1536894
Date Analyzed: 10/14/2019 22:36

Spike Duplicate ID: LCSD for HBN 1195932 [XXX42415]
Spike Duplicate Lab ID: 1536895
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195932001, 1195932002, 1195932003, 1195932004, 1195932005

Results by **AK103**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	20	18.4	92	20	18.2	91	(60-120)	1.10	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	102	102	0.4	98.8	99	(60-120)	2.90	

Batch Information

Analytical Batch: **XFC15404**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **CMS**

Prep Batch: **XXX42415**
Prep Method: **SW3520C**
Prep Date/Time: **10/08/2019 08:20**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1800518 [XXX/42418]
Blank Lab ID: 1536904

Matrix: Soil/Solid (dry weight)

QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
Acenaphthene	12.5U	25.0	6.25	ug/Kg
Acenaphthylene	12.5U	25.0	6.25	ug/Kg
Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/Kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/Kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/Kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/Kg
Chrysene	12.5U	25.0	6.25	ug/Kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/Kg
Fluoranthene	12.5U	25.0	6.25	ug/Kg
Fluorene	12.5U	25.0	6.25	ug/Kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/Kg
Naphthalene	10.0U	20.0	5.00	ug/Kg
Phenanthrene	12.5U	25.0	6.25	ug/Kg
Pyrene	12.5U	25.0	6.25	ug/Kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	79	58-103		%
Fluoranthene-d10 (surr)	85.8	54-113		%

Batch Information

Analytical Batch: XMS11788
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 10/9/2019 10:36:00PM

Prep Batch: XXX42418
Prep Method: SW3550C
Prep Date/Time: 10/8/2019 8:35:36AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

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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 1195932 [XXX42418]
Blank Spike Lab ID: 1536905
Date Analyzed: 10/09/2019 22:56

Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009

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

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	85.0	77	(43-111)
2-Methylnaphthalene	111	81.9	74	(39-114)
Acenaphthene	111	89.9	81	(44-111)
Acenaphthylene	111	94.7	85	(39-116)
Anthracene	111	98.5	89	(50-114)
Benzo(a)Anthracene	111	96.5	87	(54-122)
Benzo[a]pyrene	111	92.3	83	(50-125)
Benzo[b]Fluoranthene	111	101	91	(53-128)
Benzo[g,h,i]perylene	111	94.0	85	(49-127)
Benzo[k]fluoranthene	111	96.4	87	(56-123)
Chrysene	111	96.9	87	(57-118)
Dibenzo[a,h]anthracene	111	94.1	85	(50-129)
Fluoranthene	111	97.9	88	(55-119)
Fluorene	111	97.3	88	(47-114)
Indeno[1,2,3-c,d] pyrene	111	102	92	(49-130)
Naphthalene	111	76.9	69	(38-111)
Phenanthrene	111	98.8	89	(49-113)
Pyrene	111	102	92	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111	75.9	76	(58-103)
Fluoranthene-d10 (surr)	111	84.5	85	(54-113)

Batch Information

Analytical Batch: **XMS11788**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **DSD**

Prep Batch: **XXX42418**
Prep Method: **SW3550C**
Prep Date/Time: **10/08/2019 08:35**
Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1195957001
MS Sample ID: 1536906 MS
MSD Sample ID: 1536907 MSD

Analysis Date: 10/10/2019 1:00
Analysis Date: 10/10/2019 1:20
Analysis Date: 10/10/2019 1:40
Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009

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

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	13.4U	119	99.5	84	120	96.7	81	43-111	2.90	(< 20)
2-Methylnaphthalene	13.4U	119	96.2	81	120	92.7	78	39-114	3.70	(< 20)
Acenaphthene	13.4U	119	95.7	81	120	94.4	79	44-111	1.40	(< 20)
Acenaphthylene	13.4U	119	104	87	120	102	86	39-116	1.30	(< 20)
Anthracene	13.4U	119	97.3	82	120	97.9	82	50-114	0.65	(< 20)
Benzo(a)Anthracene	13.4U	119	97.7	82	120	100	84	54-122	2.40	(< 20)
Benzo[a]pyrene	13.4U	119	97.3	82	120	99.1	83	50-125	1.80	(< 20)
Benzo[b]Fluoranthene	13.4U	119	103	86	120	103	86	53-128	0.57	(< 20)
Benzo[g,h,i]perylene	13.4U	119	103	87	120	104	87	49-127	0.72	(< 20)
Benzo[k]fluoranthene	13.4U	119	102	86	120	105	88	56-123	3.00	(< 20)
Chrysene	13.4U	119	102	86	120	102	85	57-118	0.17	(< 20)
Dibenzo[a,h]anthracene	13.4U	119	106	89	120	107	90	50-129	1.40	(< 20)
Fluoranthene	13.4U	119	95.0	80	120	97.1	81	55-119	2.10	(< 20)
Fluorene	13.4U	119	101	85	120	101	84	47-114	0.04	(< 20)
Indeno[1,2,3-c,d] pyrene	13.4U	119	111	94	120	111	93	49-130	0.19	(< 20)
Naphthalene	10.7U	119	89.8	76	120	88.6	74	38-111	1.50	(< 20)
Phenanthrene	13.4U	119	97.9	83	120	98.3	82	49-113	0.34	(< 20)
Pyrene	13.4U	119	104	88	120	103	86	55-117	0.96	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		119	95.1	80	120	93.8	79	58-103	1.40	
Fluoranthene-d10 (surr)		119	93.1	78	120	95.9	80	54-113	3.00	

Batch Information

Analytical Batch: XMS11788
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 10/10/2019 1:20:00AM

Prep Batch: XXX42418
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 10/8/2019 8:35:36AM
Prep Initial Wt./Vol.: 22.74g
Prep Extract Vol: 5.00mL

Print Date: 10/16/2019 4:19:37PM

Method Blank

Blank ID: MB for HBN 1800525 [XXX/42419]
Blank Lab ID: 1536943

Matrix: Soil/Solid (dry weight)

QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	87	60-120		%

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 10/10/2019 11:28:00AM

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/8/2019 10:12:43AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [XXX42419]
Blank Spike Lab ID: 1536944
Date Analyzed: 10/10/2019 11:38

Spike Duplicate ID: LCSD for HBN 1195932 [XXX42419]
Spike Duplicate Lab ID: 1536945
Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009

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	833	809	97	833	759	91	(75-125)	6.40	(< 20)
Surrogates									
5a Androstane (surr)	16.7	99.9	100	16.7	93.1	93	(60-120)	7.10	

Batch Information

Analytical Batch: **XFC15389**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX42419**
Prep Method: **SW3550C**
Prep Date/Time: **10/08/2019 10:12**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1800525 [XXX/42419]
Blank Lab ID: 1536943

Matrix: Soil/Solid (dry weight)

QC for Samples:
1195932006, 1195932007, 1195932008, 1195932009

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62 (surr)	89.5	60-120		%

Batch Information

Analytical Batch: XFC15389
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 10/10/2019 11:28:00AM

Prep Batch: XXX42419
Prep Method: SW3550C
Prep Date/Time: 10/8/2019 10:12:43AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1195932 [XXX42419]
Blank Spike Lab ID: 1536944
Date Analyzed: 10/10/2019 11:38

Spike Duplicate ID: LCSD for HBN 1195932 [XXX42419]
Spike Duplicate Lab ID: 1536945
Matrix: Soil/Solid (dry weight)

QC for Samples: 1195932006, 1195932007, 1195932008, 1195932009

Results by **AK103**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	833	901	108	833	842	101	(60-120)	6.80	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	100	100	16.7	91	91	(60-120)	9.90	

Batch Information

Analytical Batch: **XFC15389**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX42419**
Prep Method: **SW3550C**
Prep Date/Time: **10/08/2019 10:12**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

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SGS **1195932**

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CHAIN OF CUSTODY RECORD

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 1

CLIENT: Restoration Science			
CONTACT: Lisa Koeneman	PHONE #: 278-1023		
PROJECT NAME: ARRC Hurricane	PROJECT/ PWSID/ PERMIT#: 19-2038		
REPORTS TO: RSE	E-MAIL: Profile #: lkoeneman@restorsci.com		
INVOICE TO: Restoration Science	QUOTE #: P.O. #:		

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp / Grab / MI (Multi-incremental)	Analysis* AK102/103 - DRO/RRO (None)	8270D - PAH SIM (None)	(None)	(None)	AK101 - GRO (MeOH)	8260C - Petro VOC (MeOH)					REMARKS/LOC ID
(1) A-J	RSE-1	10/1/19	13:00	H2O	10	G	X	X			X	X					
(2) A-J	RSE-2	10/1/19	13:30	H2O	10	G	X	X			X	X					
(3) A-J	RSE-3	10/1/19	14:00	H2O	10	G	X	X			X	X					
(4) A-J	RSE-4	10/1/19	14:45	H2O	10	G	X	X			X	X					
(5) A-J	RSE-X	10/1/19	11:30	H2O	10	G	X	X			X	X					
(6) AB	RSE-5	10/1/19	16:50	SOIL	2	G	X	X			X	X					
(7) AB	RSE-6	10/1/19	16:35	SOIL	2	G	X	X			X	X					
(8) AB	RSE-7	10/1/19	16:00	SOIL	2	G	X	X			X	X					
(9) AB	RSE-X	10/1/19	18:00	SOIL	2	G	X	X			X	X					
(10) A (11) A-F																	

NOTE:
*The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

	Date	Time	Received By:
Relinquished By: (1)	10/3/19	12:14	
Relinquished By: (2)			
Relinquished By: (3)			
Relinquished By: (4)	10/3/19	12:14	Received For Laboratory By:

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Profile #362788

1) 4.5 DSG Temp Blank °C:
2) 4.2 DS2
or Ambient [ ]

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: **1195932**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	Absent
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
	N/A	**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 4.5 °C Therm. ID: D59
	Yes	Cooler ID: 2 @ 4.2 °C Therm. ID: D52
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	No	Container 3B was received underpreserved, and was preserved to compliance using 2mL of HCl, LW09-0463-15-14.
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	Container 2H was received empty. Logging in with limited volume.
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	No	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

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

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1195932001-A	HCL to pH < 2	OK
1195932001-B	HCL to pH < 2	OK
1195932001-C	No Preservative Required	OK
1195932001-D	No Preservative Required	OK
1195932001-E	HCL to pH < 2	OK
1195932001-F	HCL to pH < 2	OK
1195932001-G	HCL to pH < 2	OK
1195932001-H	HCL to pH < 2	OK
1195932001-I	HCL to pH < 2	OK
1195932001-J	HCL to pH < 2	OK
1195932002-A	HCL to pH < 2	OK
1195932002-B	HCL to pH < 2	OK
1195932002-C	No Preservative Required	OK
1195932002-D	No Preservative Required	OK
1195932002-E	HCL to pH < 2	OK
1195932002-F	HCL to pH < 2	OK
1195932002-G	HCL to pH < 2	QN
1195932002-H	HCL to pH < 2	OK
1195932002-I	HCL to pH < 2	OK
1195932002-J	HCL to pH < 2	OK
1195932003-A	HCL to pH < 2	OK
1195932003-B	HCL to pH < 2	PA
1195932003-C	No Preservative Required	OK
1195932003-D	No Preservative Required	OK
1195932003-E	HCL to pH < 2	OK
1195932003-F	HCL to pH < 2	OK
1195932003-G	HCL to pH < 2	OK
1195932003-H	HCL to pH < 2	OK
1195932003-I	HCL to pH < 2	OK
1195932003-J	HCL to pH < 2	OK
1195932004-A	HCL to pH < 2	OK
1195932004-B	HCL to pH < 2	OK
1195932004-C	No Preservative Required	OK
1195932004-D	No Preservative Required	OK
1195932004-E	HCL to pH < 2	OK
1195932004-F	HCL to pH < 2	OK
1195932004-G	HCL to pH < 2	OK
1195932004-H	HCL to pH < 2	OK
1195932004-I	HCL to pH < 2	OK
1195932004-J	HCL to pH < 2	OK
1195932005-A	HCL to pH < 2	OK
1195932005-B	HCL to pH < 2	OK
1195932005-C	No Preservative Required	OK
1195932005-D	No Preservative Required	OK
1195932005-E	HCL to pH < 2	OK
1195932005-F	HCL to pH < 2	OK
1195932005-G	HCL to pH < 2	OK
1195932005-H	HCL to pH < 2	OK
1195932005-I	HCL to pH < 2	OK
1195932005-J	HCL to pH < 2	OK
1195932006-A	No Preservative Required	OK
1195932006-B	Methanol field pres. 4 C	OK
1195932007-A	No Preservative Required	OK
1195932007-B	Methanol field pres. 4 C	OK
1195932008-A	No Preservative Required	OK
1195932008-B	Methanol field pres. 4 C	OK
1195932009-A	No Preservative Required	OK
1195932009-B	Methanol field pres. 4 C	OK
1195932010-A	Methanol field pres. 4 C	OK
1195932011-A	HCL to pH < 2	OK
1195932011-B	HCL to pH < 2	OK
1195932011-C	HCL to pH < 2	OK
1195932011-D	HCL to pH < 2	OK
1195932011-E	HCL to pH < 2	OK
1195932011-F	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

Attachment E:
ADEC Laboratory Data Quality Review Checklist

RESTORATION
Science & Engineering, LLC

Laboratory Data Review Checklist

Completed By:

Lisa Koeneman

Title:

Qualified Environmental Professional

Date:

12/9/2019

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1195932

Laboratory Report Date:

10/16/2019

CS Site Name:

ARRC Hurricane former UST site

ADEC File Number:

2258.26.008

Hazard Identification Number:

23545

1195932

Laboratory Report Date:

10/16/2019

CS Site Name:

ARRC Hurricane former UST site

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

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

   Yes☒ No☐ N/A☐ Comments:

SGS North American received all the samples and performed all the analyses.

   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☐ N/A☒ Comments:

The samples were not transferred.

2. Chain of Custody (CoC)

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

   Yes☒ No☐ N/A☐ Comments:

The completed, signed and dated COC is provided with the lab report.

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

DRO, GRO, RRO, Petro VOCs and PAH SIMs were requested.

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

The two sample coolers were delivered at 4.5°C and 4.2°C, respectively.

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

   Yes☐ No☒ N/A☐ Comments:

Container 3B was delivered underpreserved.
Container 2H was received empty.

1195932

Laboratory Report Date:

10/16/2019

CS Site Name:

ARRC Hurricane former UST site

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

Yes☒ No☐ N/A☐ Comments:

The sample receipt form indicates that not all VOAs were free of headspace. The comments section states that Container 2H, a trip blank vial, was received empty. This container was not used for analysis, as there was no product in it. The lab was able to perform the requested analyses using the other VOAs for that particular sample.

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☐ N/A☐ Comments:

Container 3B was preserved to compliance at the lab using 2 mL of HCl in the lab.
The lab was able to log with limited volume despite Container 2H being delivered empty.

e. Data quality or usability affected?

Comments:

The underpreserved container 3B was able to be preserved to compliance. There was no effect on the data usability for the associated sample, RSE-3.
The lab was able to perform the requested analyses for the trip blank despite Container 2H being delivered empty. Therefore, these discrepancies do not effect the data usability.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

The case narrative is present and understandable.

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

Yes☒ No☐ N/A☐ Comments:

4-bromofluorobenzene (surrogate) percent recoveries for AK101 in samples RSE-7 and RSE-X and in the LCSD do not meet lab criteria due to a matrix interference. The LCS/LCSD percent recovery and RPD for methyl-butyl-ether do not meet lab criteria.

c. Were all corrective actions documented?

Yes☐ No☒ N/A☐ Comments:

No corrective actions were taken.

1195932

Laboratory Report Date:

10/16/2019

CS Site Name:

ARRC Hurricane former UST site

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

Comments:

The case narrative does not indicate whether the 4-bromofluorobenzene (surrogate) QC failures have any effect on the data quality and usability. The failed LCS/LCSD percent recoveries and RPDs for methyl-butyl-ether do not have an effect on the usability of the data because this analyte was not detected above the LOQ in the associated samples.

5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

All requested analyses were performed.

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

All samples were delivered and extracted within the applicable holding times.

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

All soils are reported on a dry weight basis.

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

Yes☐ No☒ N/A☐ Comments:

Several analytes have LOQs above the ADEC action levels for soil.

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e. Data quality or usability affected?

Some of the analytes that have LOQs above the ADEC action levels are not COPCs for this site, so that data is not affected. However, the LOQs for benzene and ethylbenzene are above the ADEC action levels and those could be considered COPCs for this site.

The LOD for benzene is 159.8 ug/Kg, which is two times the DL (79.9 ug/Kg). The non-detect result for benzene in RSE-7 is 128 ug/Kg, below the LOD. In this case, the non-detect result can be compared against this LOD of 159.8 ug/Kg for action level purposes, as the LOQ is above the ADEC cleanup level of 22 ug/Kg. Additionally, the non-detect result for benzene in RSE-X is 105 ug/Kg, above the ADEC cleanup level of 22 ug/Kg, but below the LOD of 159.8 ug/Kg. In benzene for both RSE-7 and RSE-X, the LOD can be used as an alternative cleanup standard. RSE-7 and RSE-X both yield other COPC results that are above ADEC action levels, indicating that these samples are contaminated regardless.

The same method applies to the ethylbenzene result for RSE-7 and RSE-X, which yield non-detect results of 256 ug/Kg and 210 ug/Kg, respectively, above the ADEC cleanup level of 130 ug/Kg. The LOD for ethylbenzene is 320 ug/Kg, so both RSE-7 and RSE-X benzene results can be compared to this limit instead of the ADEC cleanup level. As stated previously, both RSE-7 and RSE-X have several COPC results that exceed ADEC cleanup levels, indicating that these samples are contaminated.

Additionally, this site is not being considered for closure at this time, so the non-detect benzene and ethylbenzene results in RSE-7 and RSE-X do not affect the overall usability of the data.

6. QC Samples

a. Method Blank

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

Yes☒ No☐ N/A☐ Comments:

One method blank is reported for 4 soil samples and one method blank is reported for 5 water samples.

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All Method Blank results are less than their LOQs.

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

Comments:

N/A – No samples are affected because all Method Blank results are within lab limits.

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

Yes☐ No☐ N/A☒ Comments:

All Method Blank results are less than their LOQs.

v. Data quality or usability affected?

Comments:

The data quality and usability are not affected because the Method Blank results are within lab limits.

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☐ N/A☐ Comments:

One LCS/LCSD is reported for organic analyses in the 5 water samples and one LCS/LCSD is reported for the organic analyses in the 4 soil samples.

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

Yes☐ No☐ N/A☒ Comments:

No metals or inorganics were analyzed.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

The percent recovery for 4-bromofluorobenzene in the Blank Spike Duplicate (water) was outside of the lab limits.
The percent recovery in the LCSD for methyl-butyl-ether (Method 8260C) is outside of the lab limits.

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

Yes☐ No☒ N/A☐ Comments:

The RPD in the LCSD for methyl-butyl-ether (Method 8260C) is outside of the lab limits.

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

Comments:

1195932001, 1195932002, 1195932003, 1195932004, 1195932005, 11959320011

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

Yes☒ No☐ N/A☐ Comments:

The affected samples are listed at the top of the page. The QC criteria failures are marked with an asterisk (*).

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Methyl-butyl-ether is not a COPC for this site. Additionally, both the failed percent recovery and RPD for the LCSD are above the lab limits, indicating that the sample results will be biased high, if anything.
The failed surrogate recovery for GRO in the LCSD are biased high, indicating that the sample results will be biased high, if at all.
For these, reasons there is no effect on the overall usability of the data.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

One MS/MSD is reported for soil and one Blank Spike and duplicate are reported for water.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No metals or inorganics were analyzed.

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iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

All percent recoveries for the MS/MSD are within lab limits.

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

Yes☒ No☐ N/A☐ Comments:

All RPDs for the MS and MSD are within lab limits.

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

Comments:

N/A – No samples are affected.

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

Yes☐ No☐ N/A☒ Comments:

All percent recoveries and RPDs are within lab limits.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

All percent recoveries and RPDs are within lab limits, indicating that all data quality and usability are unaffected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

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

Yes☒ No☐ N/A☐ Comments:

Surrogate recoveries are reported for the organic analyses.

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ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☐ No☒ N/A☐ Comments:

4-bromofluorobenzene results in AK101 for RSE-7 and RSE-X were 587% and significantly above the lab limit of 150%.

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

Yes☒ No☐ N/A☐ Comments:

The failed surrogates are marked with an asterisk (*).

iv. Data quality or usability affected?

Comments:

GRO results in RSE-7 and RSE-X were found to be below the ADEC action level, indicating that this surrogate failure does not affect the data quality and usability, as the GRO results are likely biased high.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

One trip blank was reported for soil and one trip blank was reported for water.

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☐ N/A☐ Comments:

The coolers are clearly indicated on the COC.

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All Trip Blank results are less that their LOQs.

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

Comments:

N/A – All Trip Blank results are below their LOQs.

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v. Data quality or usability affected?

Comments:

Trip Blank results do not indicate that the data quality and usability are affected

f. Field Duplicate

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

Yes☒ No☐ N/A☐ Comments:

RSE-X (soil) is a blind duplicate of soil sample RSE-7. RSE-X (water) is a blind duplicate of water sample RSE-4.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

Both RSE-X (soil) and RSE-X (water) were submitted to the lab for quality control purposes.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (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☒ N/A☐ Comments:

All RPDs for the parent water sample and the water duplicate were within the 30% limit allowed by the lab.
Some RPDs for the parent soil sample and duplicate soil sample were outside of the 50% limit allowed by the ADEC.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The water data quality and usability are not affected, because the parent and duplicate sample RPDs were within the 30% limit allowed by the lab.
The soil data quality and usability are not affected because the RPD discrepancies might represent a heterogenous matrix at the site.

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

Yes☐ No☐ N/A☒ Comments:

No decontamination or equipment blank was submitted. RSE used new-dedicated sampling equipment for each soil sample and for water sampling when possible. Any non-dedicated water sampling equipment was thoroughly decontaminated between collecting each sample using a distilled water and Alcanox wash.

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

Yes☐ No☐ N/A☒ Comments:

No decontamination or equipment blank was submitted

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

Comments:

N/A - No decontamination or equipment blank was submitted

iii. Data quality or usability affected?

Comments:

The data quality and usability are not affected because no decontamination or equipment blank was submitted

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

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

No other data flags or qualifiers were reported by the lab.

Attachment F:

Field Notes

RESTORATION
Science & Engineering, LLC

19-2038 10/1/19 LK 42°

Overcast

8:00 - pick up DL truck

9:00 - pack up
- leave Anchorage

12:00 - arrive @ Hurricane
- locate wells

12:30 - start @ RSE 1

DTW x 3 = 4.37
DTB x 3 = 7.94

purge 3 gallons

DTW x 3 = 5.95

	°C	pH	Cond	SP CON	mg/L DO
12:45	9.5	5.30	22.8	.952	7.80
1200	9.6	5.29	24.2	.948	7.95
1255	9.5	5.28	22.9	.950	8.05

collected RSE-1 @ 13:00
no sheen/odor
clear/no turbidity
good recharge

Rite in the Rain

LA-2038 10/1/19 Windy/overcast CK 40°

13:10 - move to RSE-2

DTW x 3 = 4.16
DTB x 3 = 7.14

purge 3 gallons

DTW x 3 = 6.52

	°C	pH	COND mS	SP CON	DO mg/L
13:15	9.0	6.40	30.4	.102	6.52
13:20	9.1	6.41	33.2	.105	6.47
13:25	9.0	6.45	32.8	.107	6.48

Collected RSE-2 @ 13:30

no sheen/odor
mostly clear/slightly turbid
good recharge
some small white particulates

decon

LA-2038 10/1/19 40° CK

13:40 - move to RSE-3
- no housing on RSE-3/4" pvc

DTW x 3 = 1.78
DTB x 3 = 7.85

purge 3 gallons from RSE-3

	°C	pH	COND mS	SP CON	DO mg/L
13:50	8.4	6.92	45.2	.075	9.52
13:55	8.5	6.95	48.7	.078	9.53
13:57	8.5	6.99	46.5	.081	9.58

DTW x 3 = 5.01

Collect RSE-3 @ 14:00

no odor/sheen
no turbidity/mostly clear
some white particulates

Decon

19-2038 10/1/19 UK

14:10 Move to RSE-4
overgrown / hard to find

DTW x 3 = 3.57
DTB x 3 = 5.94

purge 3 gallons

DTW x 3 =

	°C	pH	Cond	SP Cond	DO mg/L
14:20	5.95	6.05	100	.115	6.05
14:25	5.96	6.08	102	.117	6.07
14:30	5.96	6.10	103	0.117	6.08

collect RSE-4 @ 14:45
also RSE-X @ 11:30
duplicate

no sheen / odor
mostly clear
some small white particulates
no decon / done w
submersible pump

run all purge + decon H2O
through GAC offsite

19-2038 10/1/19 UK

15:15

SET 1	+	−	HI	ELEV
				~~100.00~~
TBM	5.34		105.34	100.00
RSE-1		5.91		99.43
RSE-2		5.96		99.38
RSE-3		7.24		98.10
RSE-4		9.37		95.97
TBM	5.35			99.99

SET 2	+	−	HI	ELEV
TBM	5.51		105.51	100.00
RSE-1		6.07		99.44
RSE-2		6.12		99.39
RSE-3		7.40		98.11
RSE-4		9.52		95.99
TBM	5.51			100.00

SET 3	+	−	HI	ELEV
TBM	5.50		105.50	100.00
RSE-1		6.05		99.45
RSE-2		6.12		99.38
RSE-3		7.39		98.11
RSE-4		9.52		95.98
TBM	5.50			100.00

Rite in the Rain

19-2038 10/1/19 CK

15:45 - start getting ready to drill ~~RSE-5~~ RSE-7 w/ VDS

- RSE-7 proposed location ~40' W of SW corner of toolshed
  - actually ~20' W of SW corner

- RSE-7 down to 3'

0-1 organics

1-3 gray silt/clay w/some sand RSE-7 orange/gry

PID reading 1-3' 114.8 ppmv

Collect RSE-X from RSE-7

Collected RSE-7 @ 16:00

- moved to RSE-6

- down to 3'

0-1 organics

1-3 light gray silt/clay w/some sand

PID 1-3' 6.5 PPMV

RSE-6 from 1-3' @ 16:35

19-2038 10/1/19 CK

moved to RSE-5

down to 3'

0-1 organics

1-3 light gray-orange silt/clay w/some sand

PID from 1-3' 3.9 ppmv

RSE-5 collected @ 16:55

Rite in the Rain

19-2038 10/2/19 LK

11:00 back on site
- starting @ RSE-5

~~[redacted]~~

no GW @ RSE-5
checking RSE-6 + RSE-7
no GW in any

11:45 - talk w/ Wes
- no ability to drill deeper due to [redacted] road/connection inadequacies w/ HDS

11:58 - called Russell to left message

19-2038 10/2/19 LK

12:00 - drilling to ~3' bgs @ RSE-8

collected RSE-8 @ 12:15

0-1 organics
1-2 course-grained sand (gray)
2-3 dense light gray silt/clay

odor

PID (1-3') = 189.4

12:20 move to RSE-9

collected RSE-9 @ 12:30

0-1 organics
1-3 course-grained gray sand
2-3 dense light-gray clay/silt

PID (1-3) = 1271

Rite in the Rain

ARRC Hurricane 37° dar
10/17/19 19-2036 L. Koeneman

14:00 - arrive on site
- snow @ all locations

14:10 - getting set up @ RSE-5
- drilling pilot hole w/ JMC
- went to 10' w/ JMC

1-3 dry orange brown fine sand w/ grey silt

RSE-5A PID = 0.5

3-8 most dense silt brown

RSE-5B PID = 0.7

8-9 wet coarse sand w silt

RSE-5C PID = 0.5

tried to get piezo down hole, only went to 3'

19-2036 ARRC Hurricane
10/17/19 L. Koeneman

15:00 - left pipe in RSE-5
- moved to RSE-6

- got down to 6'
(2 JMC sections)
- got it stuck @ ~4'
- broke 3 steps trying to get it out

1-3 coarse-grained sand w/ gvl light gray-tan
RSE-6A PID = 3.4

RSE-6 down to 6'
piezo down ~~to~~ 5'
no GW

RSE-7 down to 6'
no piezo
soil wet

Rite in the Rain

19-2036 ARPC Hurricane

10/18/19 L. Koeneman

- Back in office
- adding additional notes for yesterday (10/17/19)

RSE-5

- drilled down to ~9' bgs w/ JMC (pilot hole)
- tried to install piezo w/ piping (7' total)
- only able to get it in ~4'
- no GW in piezo

19-2036 ARPC Hurricane

10/18/19 L. Koeneman

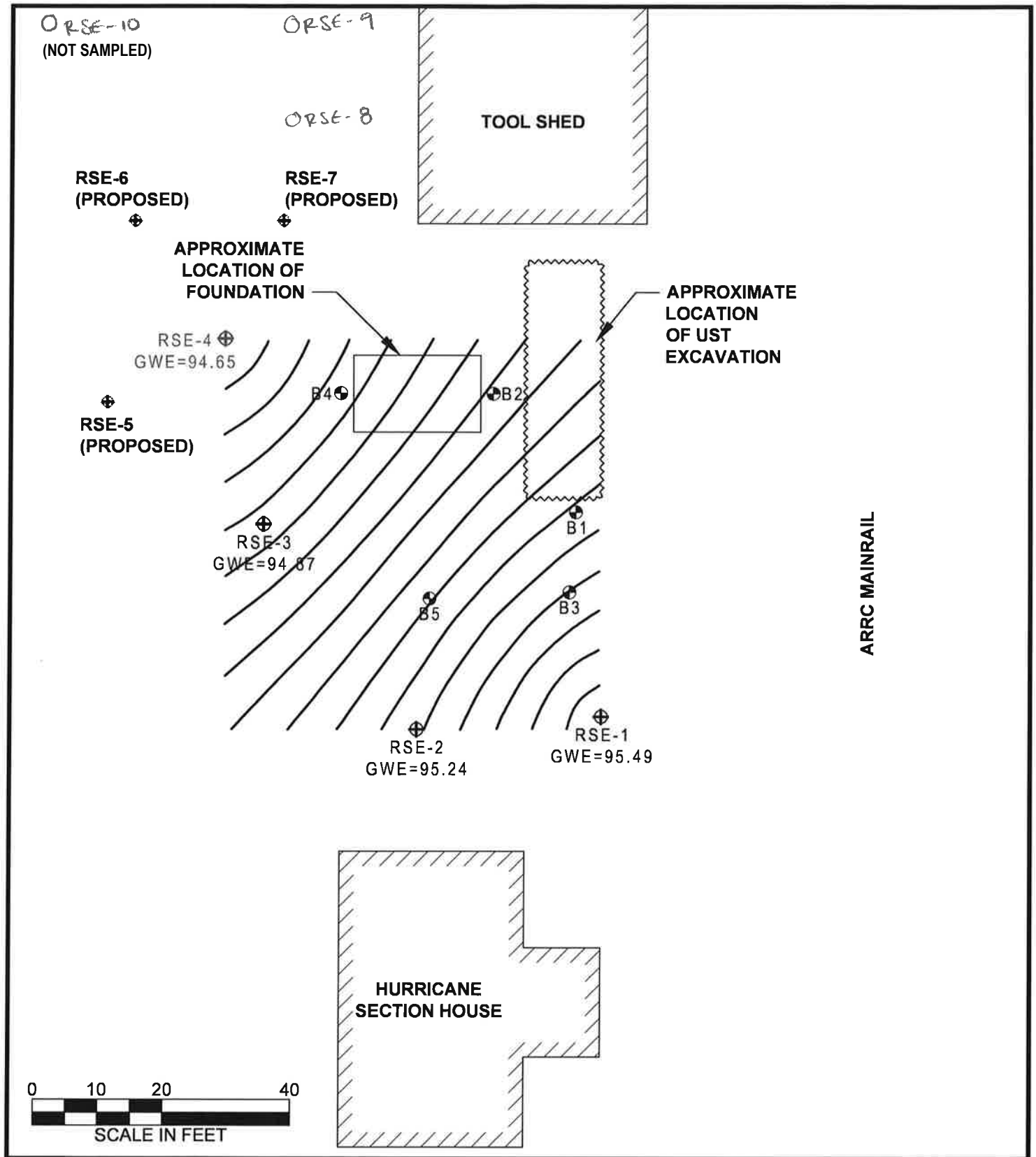
RSE-6

- installed JMC equipment to ~6' bgs
- installed piezo w/ piping to ~5' bgs
- some wet silt/sand was sucked up w/ peri pump
- Let sit for ~1 hour and still no GW
- Water in 3-6' zone

RSE

- drilled pilot hole ~6' bgs
- no GW encountered
- no piezo installed

Rite in the Rain



LEGEND

RSE-1	APPROXIMATE LOCATION OF MONITORING WELL
RSE-4	GROUNDWATER SAMPLE EXCEEDS ADEC CLEANUP CRITERIA
B1	CLARUS SOIL BORING LOCATION
GWE	GROUND WATER ELEVATION

HURRICANE SECTION HOUSE

SITE PLAN

HURRICANE, ALASKA

RESTORATION Science & Engineering, LLC
911 West 8th Avenue, Suite 100
Anchorage, Alaska 99501
PH (907) 278-1023 FAX (907) 277-5718

JOB NO: 19-2038	DRAWN: MB
DATE: 9.16.2019	CHECKED: LK

FIGURE 2